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The attention of every reader of the paper is particularly directed to the *BUYER'S GUIDE* on pages 3, 4, 6, 8, 10, 12, 13 and 14 and to the *ALPHABETICAL INDEX* of Advertisers on page 15 At the present time buyers in every part of the world are no doubt interested in establishing new connections for the purchase of lines cut off by the European war and it is recommended that this Buyer's Guide be retained for reference as it contains a classified list of several hundred articles, together with the names of manufacturers or exporters from whom they may be obtained.

Correspondence regarding any topic of international trade interest is invited from readers of the Review and contributions on such subjects, if available for publication, will be paid for at space rates. Photographs of commercial scenes will be purchased, if suitable for reproduction. Manuscripts and photographs not used will be returned promptly if postage is sent for that purpose.

Contents

JUNE, 1915

FILLING THE WORLD'S SUGAR BOWLS 59-62
COAL—THE LODESTONE OF INDUSTRY 63-67
AUSTRALIA'S MANY ATTRACTIONS FOR TOURISTS 67-70
DETROIT—THE AUTOMOBILE CITY 71-75
SHIP CHARTERING IN INTERNATIONAL TRADE 76-79
A SOUTH AMERICAN FIELD FOR ENTERPRISE 80
CONDITIONS OF THE CHILEAN NITRATE INDUSTRY 80
NATIONAL PAVILIONS AT PANAMA-PACIFIC EXPOSITION 81-82

ON THE HIGHWAYS OF COMMERCE

GREAT COALING STATIONS AT PANAMA 83-84
ICELAND'S COMMERCE WITH AMERICA 84

THE MOTOR CAR WORLD

MOTOR BUSES AND JITNEYS 85
MOTORCYCLES IN RUSSIA 85-86
A MOTORCYCLE AMBULANCE 86

INTERNATIONAL TRADE CONDITIONS

ARCHANGEL AND VLADIVOSTOK IN WAR TIMES 87
AMERICAN EXPORTS LARGE AND VARIED 88
PHILIPPINE EXPORTS AND IMPORTS 88
PROSPECTING FOR RADIUM IN JAMAICA 88
TRADE CONDITIONS IN BRAZIL 88-89

BOOK REVIEWS 90
INFORMATION FOR BUYERS . . . . . 91-92-93-94-95-96-97 and 99

Courtesy Bureau of Mines,
Department of Interior

Modern steel headframe, bins and trestle at the pitmouth of a coal mine, where long trains of cars are loaded for the seaboard and interior terminals. These lofty monuments of industry dominate the landscape in the coal fields of America

The Havemeyer & Elder sugar refinery—one of those on the Brooklyn shore of the East River, New York City. These great establishments are among the most striking landmarks of the waterfront

FILLING THE WORLD'S SUGAR BOWLS

America the Largest Refiner and Exporter of Cane Sugar—the Beet Product Much Decreased by War

Illustrated by photos loaned by the American Sugar Refining Company

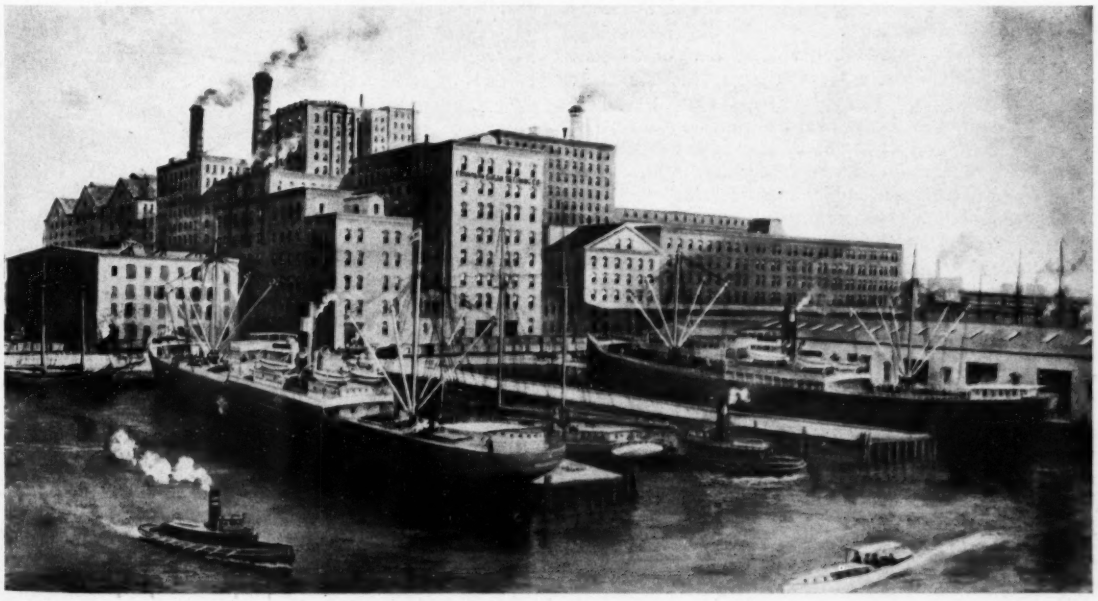
IT took a little over eighteen million long tons of the product of beet and cane to fill the world's sugar bowls in the year before the great war began. There will be about 2,635,000 tons less in them this year, according to one expert estimate. Of this huge deficit 2,485,000 tons represents the falling off in the European crop. Owing to the deterrent effect of war on international trade, what is produced will not be evenly distributed. Some nations will have a surplus and others a shortage.

A striking indication of the tremendous economic importance of sugar is seen in the recent action of France and Germany. In the face of a life and death struggle that is calling for the strength of every man, these governments have temporarily released from military service all the skilled workers connected with the beet sugar industry. They have been granted sufficient furloughs to manufacture this year's crop and to put the mills in order to handle next year's.

Beet sugar is the mainstay of Europe, but it constitutes less than half the total sugar production of the world. The European countries now at war produced more than 8,000,000 tons of beet sugar last year. Germany is the largest grower and manufacturer in the world, her output in 1913 amounting to nearly 2,750,000 tons. Austria was next, with almost 2,000,000; then Russia, with more than a million and a third; France, with a little less than a million, and Belgium with scarcely a third as much. Holland's output runs a little ahead of Belgium's. Every European country, even Sweden and Switzerland, produces some beet sugar. The American crop is less than two-thirds of a million tons, but practically none of it is exported. England's production is very small. In 1913 it imported 1,600,000 tons, two thirds of which came from Germany and Austria.

In this connection the annual per capita consumption of sugar becomes interesting. Denmark leads, each of her inhabitants using 98.96 pounds per year. Then come England, 95.52; United States, 85.40; Switzerland, 77.24; Sweden, 57.09; Netherlands, 49.90; Germany 48.95; Norway, 45.83; France, 43.41; Belgium, 39.20; Austria, 28.12; Russia, 24.53; Turkey, 19.84; Spain, 16.24, and Italy, 10.76 pounds.

The Franklin Sugar Refinery, Philadelphia. Here, as elsewhere along the coast, the docks are filled with steamers bringing cargoes of raw sugar from the cane producing countries of the world



Germany's production of beet sugar this year will be about 250,000 tons less than in 1913, according to reports that have come from that country, which state that no marked shortage of agricultural laborers is anticipated as there are about 780,000 prisoners of war who can be set to work in the fields.

The street side of the Havemeyer & Elder Refinery, where the finished product is delivered to the wagons and cars

In Russia it is estimated that this year's crop will be about 200,000 tons greater than in 1913. A considerable quantity of Russian sugar has been carried over from last year. This, added to the new crop, will make the available supply about 2,100,000 tons. The greater part of this vast supply, however, will have to find its market within the boundaries of the Russian Empire. Owing to the recent prohibition of the use of alcoholic liquors, it is expected that the consumption of sugar will increase heavily. Russia's best sugar customers abroad have been Turkey and England. The war, however, has broken off all business relations with Turkey, and, since last October, the British Government has forbidden the importation of beet sugar into England with the object of preventing the possible entrance of any sugar from Germany and Austria. Aside from this, the next largest buyers of sugar from Russia—Finland and Persia—are also cut off through the difficulties of transportation and the eastward extension of the war zone in Asia.

The combined beet sugar production of France, Belgium, Serbia and England this year is estimated at only 350,000 tons, as compared with 1,020,000 tons a year ago. The price of sugar in France is practically double what it was prior to the outbreak of the war. One of the factors that has contributed to this advance, aside from shortage of production, is the necessity for the armies at the front to be supplied with food that is nutritious as well as easy to carry. This has brought about a great activity, not only in France but in all the other belligerent nations of Europe, in the manufacture of chocolate, candy, preserves and sweets of all kinds, and has increased the demand for sugar very materially.

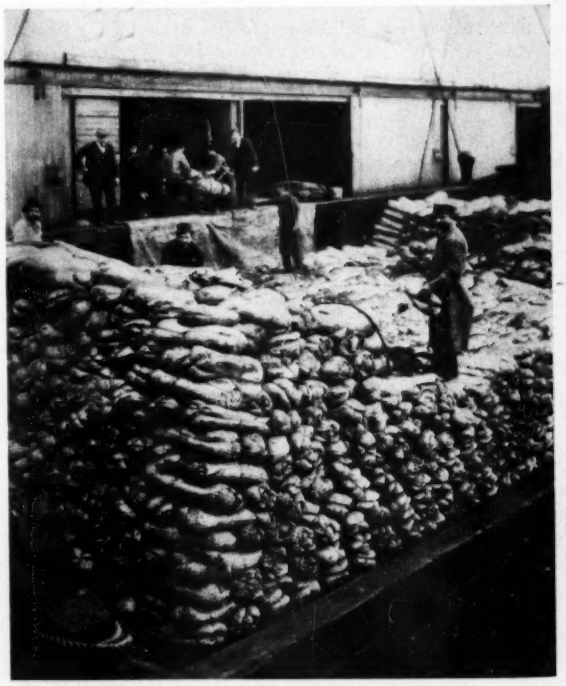
Aside from the lack of labor to till the beet fields of Europe, owing to the tremendous depletions of war, the principal cause of the large falling off in production that is looked for is the scarcity of seed. Heretofore the great bulk of the beet seed each year has been supplied by Germany. An Imperial edict, last February, forbade the exportation of beet seed as well as sugar. This step, it is said, was taken to prevent countries at war with Germany from getting any seed. Russia is the only country that has paid any attention to the production of seed, but this phase of the beet sugar industry has been centered largely in Russian Poland, where the fields have been devastated by the passage of troops and by battles. The seed that France received this spring from Russia came via Sweden. Russian beet seed has been considered inferior in quality to that grown in Germany.

The Austrian crop, it is estimated, will fall considerably below last year's figures, but as to the extent of the decrease there is no agreement among the experts. A recent American consular report from Trieste said that the Austrian sugar refineries had announced that they would supply the entire normal demand for home consumption until the new beet crop was harvested next September, and that there would be no advance over present prices which are 39c. per 100 pounds higher than in June, 1914. Usually, in the spring, stocks of Austrian refiners are almost exhausted, but because of the cutting off of the British market—ordinarily one of Austria's best customers—the warehouses are so full of old sugar as to leave little space for storing the autumn crop.

In the United States the beet sugar industry is so new and relatively unimportant that its product was not classified separately in the government statistics until a few years ago. Its growth, however, in the ten years ending with 1909, was extraordinarily rapid. In that period the tonnage of sugar produced increased more than five-fold. Since 1909 the output has risen an average of 25,000 tons a year. There are now sugar factories in 18 States, the principal centers of growing and production being Michigan, Colorado and California. In the two latter States the crop is raised mostly on irrigated land, the yield in some places being more than 20 tons of beets per acre.

One reason for this expansion of the beet sugar industry in America has been the scientific attention that has been paid to it by the Government, the factories and the growers. When sugar beets were first introduced from Europe so little was known about the methods of cultivating and handling them that skilled agriculturists and technical men from Belgium, France and Germany were brought over to take charge of the field and factory work.

Since then the sugar factories have employed the best scientific agriculturists obtainable and have placed their



Raw sugar comes to the refinery in all sorts of packages. These sacks of matting are from Iloilo, in the Philippines

knowledge and experience at the disposal of each farming community without charge. Wherever an American beet sugar factory is established it has a staff of experts as part of its regular equipment. Thenceforward these men travel throughout the beet-growing region answering questions and giving advice to the farmers. They liter-

ally live on the road during the growing season and travel so fast and far and constantly that they wear out on the average one new automobile every two years.

It is to the interest of these sugar factories to get the best possible quality of beets for treatment and refining. Therefore, their aid to the farmers has extended far beyond merely buying the raw material and paying for it. Aside from giving the most efficient help toward securing an ever-increasing beet crop, the factory experts also act as general agricultural efficiency engineers and show the farmers how to keep the soil up to its maximum of production by a rotation of crops. In many cases, also, the factories themselves own and operate large tracts of beet land. On such farms experimenting is conducted continually on an extensive scale. As fast as experience proves the worth of any new method, it is given free of charge to all the farmers roundabout, and, through its publication in pamphlets, the knowledge is still further disseminated. On this account it is believed by some experts that before many years the United States will rank as one of the great beet sugar producing countries of the world.

The quality of the sugar beet is indicated by two things: the percentage of sucrose and the coefficient of purity. Both of these have shown a steady increase in the United States during the last ten years. The percentage of sucrose is the ratio of the weight of the sugar to the weight of the whole beet; and the coefficient of purity the ratio of sugar to the solid content of the beet.

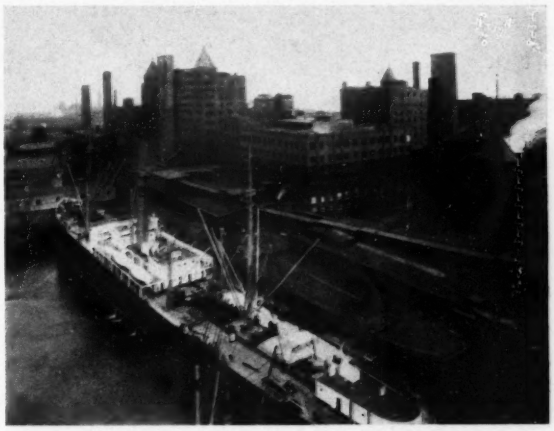
Of cane sugar, America is the greatest importer of raw and exporter of refined in the world. In the aggregate number of tons consumed by its own population the United States also ranks first. Its total consumption of sugar in 1913 was 3,743,139 tons. Of this amount 2,890,667 tons were imported, Hawaii, Porto Rico and the Philippines supplying about one-third, and Cuba most of the remainder. The cane sugar grown in the United States was a little more than 200,000 tons, while the

Raw sugar from Java comes in wicker baskets. The illustration shows it being trucked to the melter at the refinery

domestic production of beet sugar was more than three times as great.

The industry of refining cane sugar has attained tremendous proportions in America. According to the census of 1910, the value of the products of the sugar refineries was about $250,000,000 in that year.

In the fiscal year ending June 30, 1914, the imports of cane sugar and molasses—about half of which came through the port of New Orleans—were more than 51,000,000 gallons. Of beet sugar a little more than 1,000 long tons were imported, and of cane sugar for refining, 2,207,500 long tons of the dutiable and 52,120 long tons



A steamer unloading at the Havemeyer & Elder Refinery. Discharging raw sugar cargoes often goes on night and day

of the free, from the Philippines. About three-fourths of all this was entered at the port of New York and most of the remainder at New Orleans.

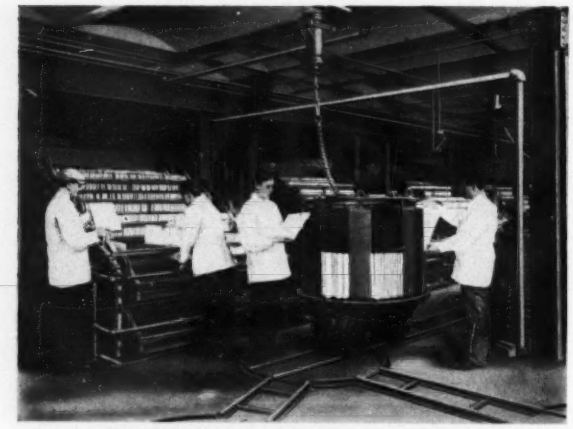
Of the refined product exported, the sugar and molasses made from cane grown and manufactured in the United States or its possessions amounted to a little more than 1,000,000 gallons, while of syrup the production reached nearly 12,000,000 gallons. Of the 23,000 tons of domestic refined sugar, about one-fourth was shipped to Newfoundland and Labrador, Cuba took nearly 1,500 tons, and Panama about 4,000 tons.

Of the dutiable sugar grown in Cuba and other cane-growing countries, a little more than 9,000 tons were exported. About four-fifths of this went to Canada and most of the rest to England. Of the beet sugar imported for refining, the exports were about 325 tons, practically all of which was shipped to Mexico.

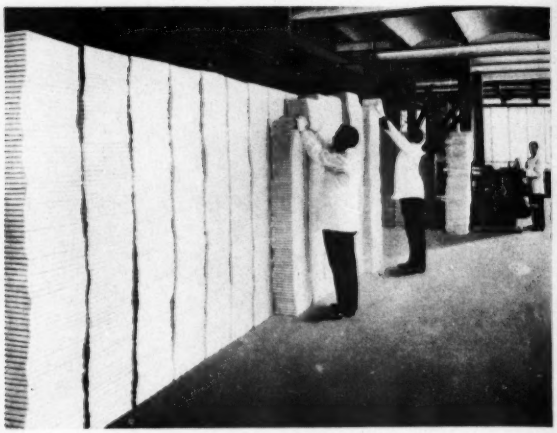
New York City is not only the great sugar shipping point in America, but it is also the chief center of the sugar refining industry. Huge refining plants are located along the East River on the Long Island side and on the west bank of the Hudson, while there is another large one on the east bank of that river a few miles above the city's northern boundary. There are also huge refineries at Philadelphia, San Francisco, New Orleans and at several other points.

To these vast refineries come a constant procession of ships from Cuba, the West Indies, Brazil and other South American countries. From Java and the Philippines, away on the other side of the world, come scores of other cargoes. Hawaii and Porto Rico send many ship loads. The raw sugar is received in sacks of jute, in reed mats, in baskets and in many other characteristic ways from the countries where it is produced. It is yellow and coarse and sticky, and the atmosphere about the sugar refinery, especially in summer time, is cloyingly sweet, particularly around the piers where the ships unload. But on the side where the refined product is stored, white and dry and clean, ready for its journeying to fill the sugar bowls across the seas, there is a vast collection of fresh, spotless barrels and cases. The exterior of the packages is transformed as much as their contents.

The effects of this unprecedented shifting of the world's sugar trade, owing to the decreased production of beet sugar and the disturbed conditions of international commerce on the other side of the Atlantic, are now beginning to be strikingly apparent. These causes and the consequent rapid increase in the demand for cane sugar are adding materially to the prosperity of those regions



Removing "Crystal Domino" plates from molds to the drying machine is one of the first steps after it has been refined



After the plates of snow-white sugar are dried they are stacked and inspected from time to time before packing

of the world where cane is grown or its product is refined.

In Cuba every stalk of cane that is worth cutting and hauling is reported as going through the mills, and there are no signs of the rate of grinding being diminished. The port receipts of raw sugar lately have been running from 20,000 to 50,000 tons more per week than in the same periods last year, and shipments are going forward as fast as steamers are available to take them. Since the first of January many new ports to which cargoes of Cuban sugar have been dispatched have been added to the list. The latter part of April 3,500 sacks were sent to Rotterdam, which, hitherto, has never been a customer for the West Indian product.

Throughout Cuba, as a result of this great activity in the demand for the island's staple, a great deal of money is being spent in the reconstruction of great mills and the building of new ones. Everywhere the efficiency of the plants is being increased as rapidly as possible. Bigger engines, pumps, evaporators, condensers, pans, crushing and grinding machinery and other apparatus of the most improved sort are being installed. It is expected that the percentage of sugar extracted from the cane will rise above 13 in many places in future.

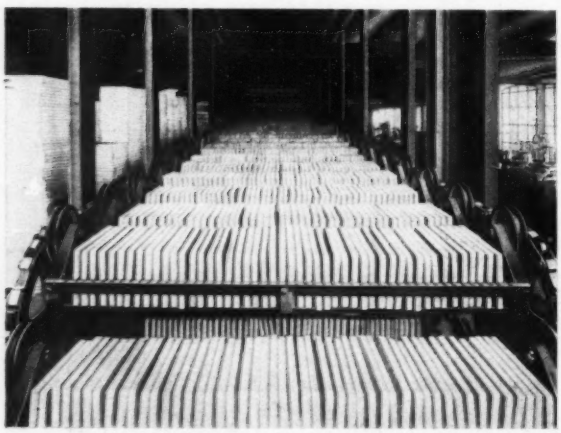
Similar activity is reported from Hawaii, the Philippines and Porto Rico. In these places, a year ago, and for some time preceding, the sugar raisers were far less prosperous than they are to-day. A combination of unfavorable climatic conditions, dull markets, and other adverse influences were against them. While nowhere are all the factors ever ideal in a single season, they are, as a whole, far better than usual this year. In the Philippines a number of new centrals are being erected in the richest sugar districts of those islands. All those in operation have been running to capacity. The grade of sugar is higher than ever before, and the amount compares favorably with the years of large production. Sugar planters are reported as selling only enough to clear them of their debts, and to be holding the balance for expected higher prices.

In the British West Indies the transition from a period of economic depression to what seems likely to be quite the other extreme is proceeding with fully as great rapidity as elsewhere. Few regions have been more unfavorably affected in the past by the steadily increasing output of beet sugar in Europe. At present, however, the demand from Great Britain is greater than the available supply of cane sugar in these islands.

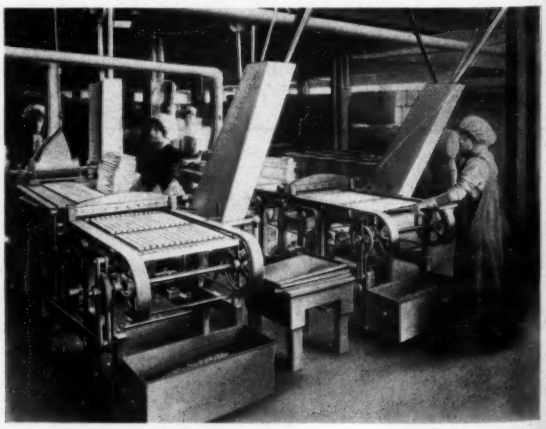
Chemistry has played an important part in the growth of the sugar industry, especially in the last quarter century. In Java, for example, a few years ago, the sugar industry was threatened with destruction by insect pests and other troubles that beset the cane with accumulating force. Chemical and biological work reclaimed the industry and placed it on a very profitable basis, with corresponding benefit to the growers.

Great advances have also been made in the manufacture of raw sugar through bringing factories under chemical control, and the cane industry has caught up with and passed the beet industry through its development along these lines. The consumption of cane sugar has been increased by the cheapening of its cost of production through scientific methods. Raw sugar has decreased in price from 2.88c. per pound (without duty) in 1890, to 2.03c. per pound in 1914, despite the fact that all other food staples have advanced considerably in price.

Miles of "Crystal Domino" sugar are being dried in this long room. This is an important part of its manufacture



After the plates of sugar have been dried they are cut into the "dominoes" and then packed into the cartons



COAL—THE LODESTONE OF INDUSTRY

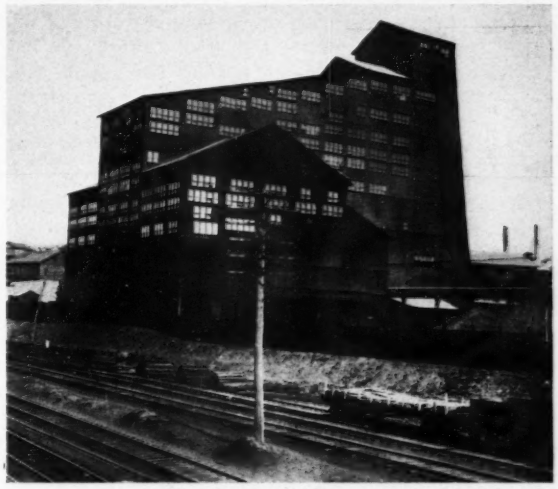
Curtailment of Coal Production in Europe, Owing to the War, is Causing the World to Turn to America for its Fuel Supplies

COAL is the lodestone of industry, the prime mover of commerce and one of the great essentials of international trade. America, Great Britain, Germany, France, Belgium and Austria produced 90 per cent. of the world's coal in 1913. Of this combined production the output of the United States amounted to 43½ per cent. With the other great coal mining nations at war, the demand abroad for American coal is assuming large proportions.

In its reserves of mineral fuels America holds an impregnable position as a world power in industry and commerce. Its production of coal surpasses that of any other nation and nearly equals the combined output of England and Germany—the countries that rank second and third. The United States also leads in low cost of mining. The relatively small cost of production in general, in the United States, is due largely to the favorable location of the coal beds and to the extensive use of machinery that has been developed to a high degree of efficiency. On the other hand, the wages paid in the coal mining industry in America are higher than in any country of Europe.

The exports of coal from the United States never have been large enough to affect the production materially, although they have trebled since 1900. In 1913 they amounted to 23,200,000 tons, which, however, was less than 4 per cent. of the total production. In that year Great Britain exported 26 per cent. and Germany 13 per cent. of their aggregate output. More than 80 per cent. of the American coal exported went to Canada, about two-thirds of the remaining 20 per cent. was shipped to Panama, Cuba and Central America, leaving only a small and scattered tonnage that was shipped overseas. This was distributed mostly in the Mediterranean and Adriatic sections of Europe and along the east and west coasts of South America. There were also some cargoes to Spain, Norway, Sweden and Baltic Sea ports.

"This oversea export business," says Mr. Charles S. Thorne, Vice-President of the Pocahontas Fuel Company, New York City, "while the present tonnage is small and represents only about one-half of one per cent. of the coal production of the United States, has increased

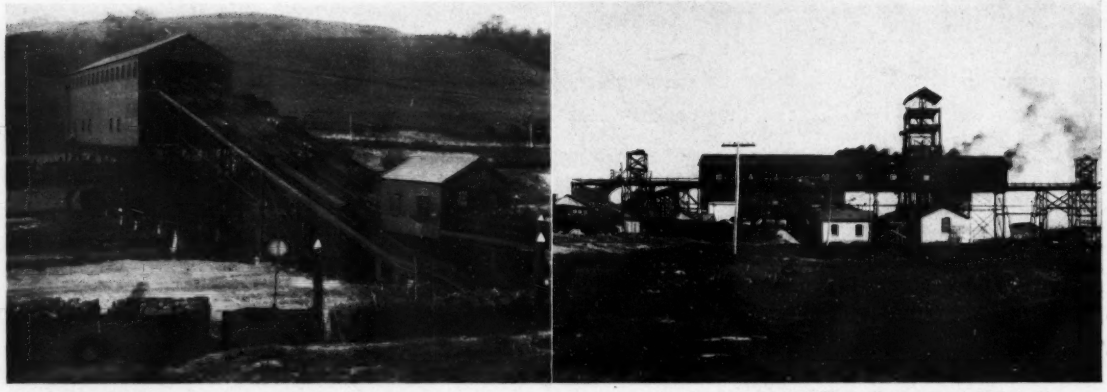


Courtesy Bureau of Mines, Department of Interior

Large anthracite breakers in an American colliery, typical of many in the Pennsylvania hard coal region

Tipple incline, showing steel link hoist on slipes for drawing up the skips loaded with coal and returning the empties. The mine entrance has concrete walls and an arch

Courtesy Bureau of Mines, Department of Interior



Courtesy Bureau of Mines, Department of Interior

At left a modern tipple showing weighing house, incline plane, etc., of a modern American colliery; at right, surface plant of the No. 5 shaft of the La Salle County Coal Company, in Illinois

rapidly, and the smokeless coal shippers from Hampton Roads are doing much to build up this business.

"During the strike in the Welsh coal fields in the early part of 1912 a persistent demand was made for the export shipments of American coal for the markets ordinarily supplied by Welsh coal, but at that time the American shippers were not prepared to respond to the demand except in a limited manner, owing to the restricted pier facilities of the railway companies for dumping coal into vessels at tidewater. This fact, however, the railroads with terminals at Hampton Roads were prompt to appreciate, and new piers with equipment for quickly loading and dispatching vessels with coal cargoes have been completed during the past year at Lambert Point and Newport News, and now the facilities of this character at Hampton Roads are of the best, and are unsurpassed along the Atlantic Coast. The smokeless coal shippers are now, therefore, prepared to handle a largely increased export cargo and bunker coal business, with the certainty of giving to the purchasers of the coal cargoes and to the ship-owners prompt dispatch for their vessels.

"The smokeless coals of America are the only ones in the world that equal the best of the Welsh or Cardiff coals. For this reason they must take a leading part in this oversea export coal business, which might develop with greater rapidity were it not for the educational work necessary on account of the fact that the American smokeless coals are soft and friable and form their solid bed of coke after firing, while the Welsh coals are hard and more lumpy, although no greater in British thermal heat units and no more efficient than American smokeless coals when the latter are understood and handled properly."

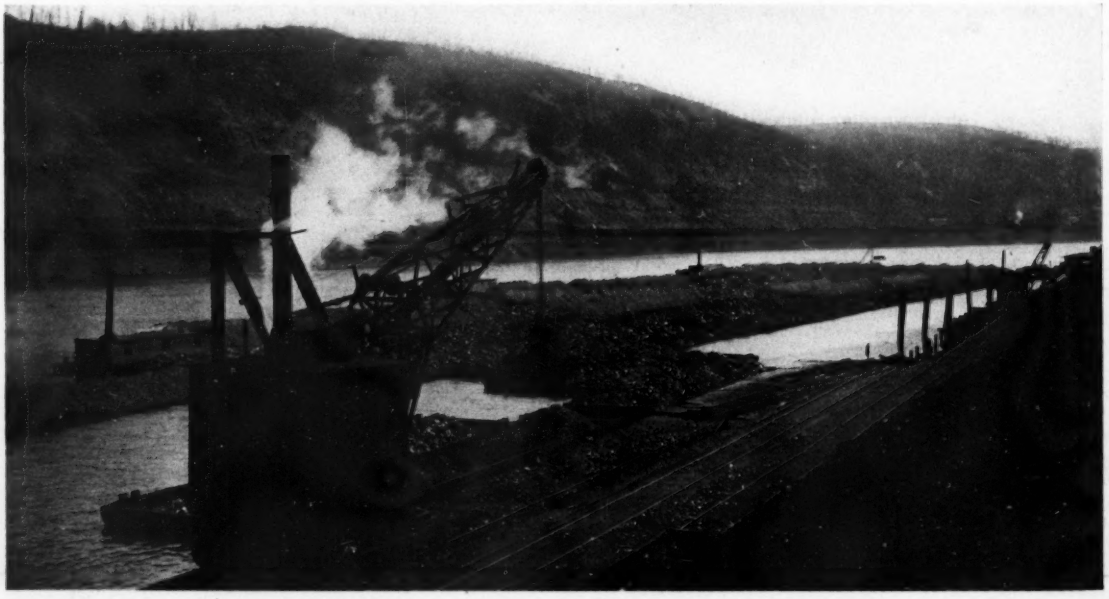
In the British coal mining regions the war has brought about a notable increase in the cost of production. This caused the Government to inquire into the reasons for the unprecedented rise, especially in retail prices, which has ranged from 7 to 11 shillings per ton, and the Board of Trade recommended that exports to neutral countries should be restricted; that steps should be taken to accumulate coal reserves in or near London for the use of small consumers during next winter, and that if prices did not shortly return to a reasonable level, the Government should consider a scheme for assuming control of the output of collieries during the continuance of the war.

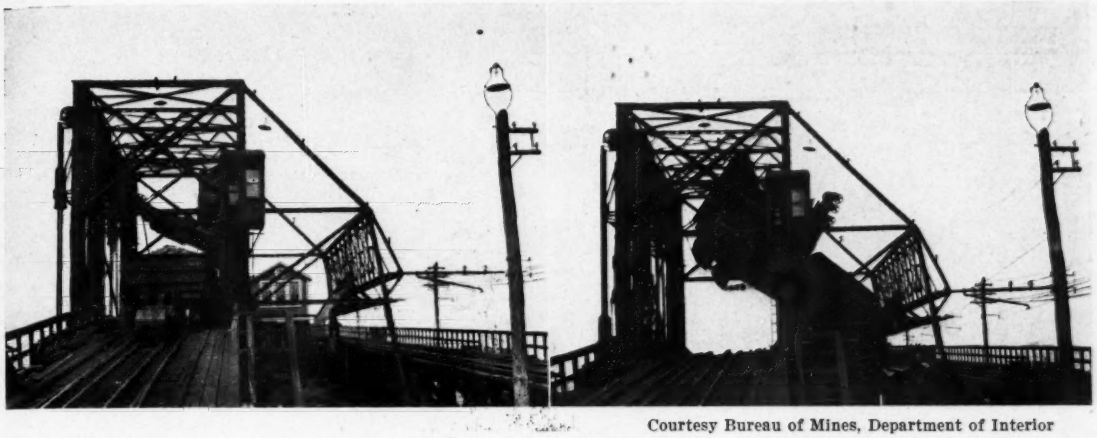
An authority who has made a study of the effect of recruiting upon the coal production of Great Britain, according to *The Coal Trade Journal* (New York), estimates that 200,000 men have left the British mines to join the army and navy, and that this represents a loss of 60,000,000 tons annually.

In this connection, the *Iron and Coal Trades Review* (London) says that reports of difficulties owing to short-

Fleet of loaded coal barges at the Duquesne plant of the Carnegie Steel Company, showing one of the barges in process of unloading by means of a clam-shell bucket outfit

Courtesy Bureau of Mines, Department of Interior





Courtesy Bureau of Mines, Department of Interior

On the Virginian Railway Company's tipple at Norfolk, each car after it has run up the incline is lifted bodily by gigantic dumping mechanism and its contents discharged as shown in the picture at the right

age of coal are coming to hand from all quarters. In South Wales steel mills have had to close down owing to the enhanced price of coal brought about by shortage of supplies. In Scotland it is roughly estimated that the output is from 70,000 to 100,000 tons a week short of current demands. It is pointed out that such a condition cannot but have a serious effect upon manufacturing and shipping, and the men remaining in the mines are urged to work more regularly as a means of partly overcoming the growing fuel scarcity.

Large quantities of American steam coal are reported to have been purchased recently by the Italian Government. The Italian State Railways have secured some 18 vessels on time charter to carry coal for their use, and other arrangements have been made for the transportation of large quantities of American coal to Italian ports. In addition to liberal freightage offered, the Italian Government is said to have undertaken to pay all war risks.

A recent American Department of Commerce report states that Italy is threatened with a coal famine. Available stocks are running low in the Milan district, and large industries are economizing their fuel in every way. Recently certain trains have been taken off by railway companies and the Government in order to save fuel. Heretofore most of the coal used in Italy has been imported from Great Britain and Germany, principally the former, and only small amounts have come from the United States. The American Pocahontas and Georges Creek coals for steam purposes, however, are much preferred to the English Cardiff, owing to the former being homogeneous and radiating heat over a larger surface while burning. The English coal, according to a large dealer in Milan, concentrates to too great an extent.

In Spain a royal decree, dated April 7, 1915, has suspended until further notice the import duty and transportation tax on coal, this exemption to apply to all shipments made to a Spanish port on or after the above date. The combined import duty and transportation tax on coal imported from the United States amounted to $1.06 per metric ton. The Director General of the Spanish Customs Department has requested quotations of current prices for coal shipped f.o.b. and c.i.f. from the United States to Spain. Hitherto Spain's imports of coal from the United Kingdom have amounted to about 2,500,000 tons annually. Only about 50,000 tons came from the United States. Spain's usual production of coal is 4,000,000 tons.

Sweden also has asked for bids for the importation of American coal. In 1913 Sweden purchased 4,500,000 tons from the United Kingdom and received none at all from the United States. The output of the Swedish coal mines was 360,000 tons in 1913.

Countries now at war have been supplying nine-tenths of the coal produced in Europe. France produces about

Coal pier at Lambert's Point, showing two coal barges loading at the same time—this vicinity is now one of the busiest maritime coaling stations in the world

Courtesy The Jeffrey Mfg. Co.

At left, an air-power coal cutter for use in mines where gas or dust interfere with ventilation; at right, a long-wall coal cutter. Note how the cutter arm projects under the coal

60 per cent. of her own requirements, but her chief coal fields are in the northeastern section, in the immediate vicinity of the great battlefields of to-day. She is Great Britain's largest customer, taking nearly 13,000,000 tons annually. Germany's coal supply is, of course, no longer available for export. Formerly she took nearly 9,000,000 tons a year of British coal. Germany's usual production is around 235,000,000 tons. Austria-Hungary has prohibited the exportation of coal. Her ordinary output is a little more than 50,000,000 tons, and she has been purchasing about 1,000,000 tons from the United Kingdom and some 50,000 tons annually from America. Russia's annual output of less than 29,000,000 tons is insufficient for her needs, and she has been the fourth largest buyer of British coals—nearly 6,000,000 tons a year. Italy does not rank among the coal-producing countries, and has taken nearly 10,000,000 tons a year from the United Kingdom and only one-third of a million tons from America. The Belgian mines are practically closed so far as exports are concerned. Their normal output was about 23,000,000 tons a year, and 2,000,000 tons were imported from the United Kingdom.

That the United States is the only logical source of supply for coal to meet European requirements is quite apparent from an examination of the figures of the world's coal production. The total coal production of the world in 1913 was 1,443,000,000 tons, of which 763,000,000 tons was produced in Europe and 570,000,000 tons in the United States, leaving but 110,000,000 tons as the entire output of the world exclusive of Europe and America. That 110,000,000 tons is produced chiefly on the opposite side of the globe. Japan leads with 22,000,000 tons; then come China and India with 17,000,000 tons each; Australia and New Zealand, 15,000,000 tons, with South Africa and South America contributing the bulk of the remainder.

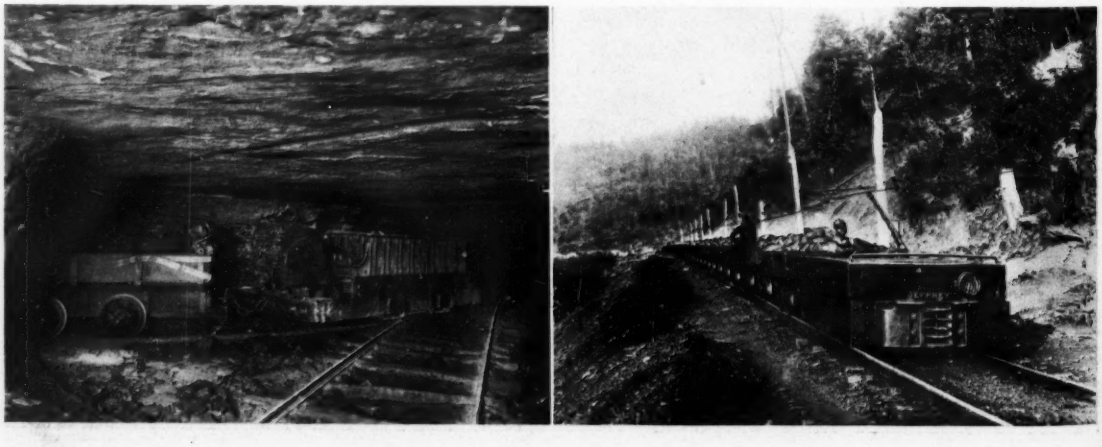
Cost of transportation is a much more important factor proportionately in coal than in most other commodities. The value of a ton of wheat now ranges between $35 and $45, and that of a ton of corn nearly the same. The middle of last April the best Cardiff coal was practically out of the market. "Best seconds" coals were then quoted at about $8.50 a ton f.o.b. Cardiff, net, exclusive of wharfage. Freights per ton from Cardiff were: Marseilles, $5; Naples, $4; Rio Janeiro, $6.35; Montevideo, $6.35; River Plate, $6.75.

In New York harbor, the middle of April, the best Pennsylvania steam coals were obtainable at $2.55 a ton and up, with choice grades at $2.75 to $3. Freight rates on coal by steamers were quoted at, from New York to a direct port in the Mediterranean not east of the west coast of Italy, Spain excluded, $10.80; Rio Janeiro, $9.85; Montevideo, Buenos Aires or La Plata, $10.80.

From the above figures it will be seen that the best American coal can be delivered even to European ports at less prices than the Cardiff "best seconds." The freight on a ton of coal, however, is nearly as much as that on a ton of wheat or corn and is a much larger percentage of cost at destination than is the case with foodstuffs. With the latter, the freight adds about 15 per cent. to its export value, while with coal it is from 200 to 300 per cent. Hence the difficulty which America has had to encounter in an attempt to make for itself a market at a highly competitive and distant point like a port of Europe.

At left, a gathering locomotive, now commonly used instead of mules for hauling loaded cars from the coal faces; at right, electric mine locomotive hauling a heavily loaded train

Courtesy The Jeffrey Mfg. Co.



Prior to January 1, 1915, wheat commanded a much higher rate per ton than coal from American ports. Since then, however, coal rates have moved upward until, in many cases recently, they have passed the grain rates, the reason being that the need for wheat had been temporarily met, while the necessity for coal was becoming more acute. The stocks of coal in the countries supplied by Great Britain are becoming exhausted, and the labor conditions in the European countries which produce coal and which are now engaged in war are becoming more and more contracted, still further curtailing the already restricted production of coal in those countries. Under the circumstances, therefore, the need for American coal growing more urgent, ships have been obtained, almost regardless of rates, as is always the case where the laws of international supply and demand operate with their maximum intensity.

South America produces comparatively little coal, and buys between 7,000,000 and 8,000,000 tons a year. Chile's coal fields are said to contain about 2,000,000,000 tons, but that country's output is only 1,000,000 tons annually. Peru's coal deposits are said to be about 40,000,000 tons, and its production 325,000 tons a year. Neither of these countries produces enough coal for local requirements, Chile's importations being 1,400,000 tons annually, and Peru's, 100,000. The eastern section of South America is by far the largest coal consuming part of the continent, but it is dependent on other parts of the world for its supply, which thus far is used chiefly for railways, power plants and industrial establishments. Argentina has been drawing practically all its requirements from Europe, while Brazil has procured about one-sixth of her total coal imports from the United States.

Doubts have been expressed as to the advisability of America's cultivating an export trade in coal, lest the country's fuel supply might thereby be depleted. This fear, however, seems scarcely justified in view of a recent statement by the United States Geological Survey which estimates that all of the coal produced from the mines of the United States since coal mining began, a century ago, amounts to but one-half of one per cent. of the original supply. When it is considered that the United States uses a larger proportion of machinery in the mining of coal than does any other country, and that but one-half of one per cent. of its supply has been exhausted, it is apparent that the quantity produced could be readily increased without materially affecting the quantity available for future generations. In its coal reserves the United States has twice as much as China—its nearest competitor in this regard—and more than four times as much as Germany, which stands third. The United States and China contain almost two-thirds of the world's total supply of high grade anthracite and bituminous coals.

AUSTRALIA'S MANY ATTRACTIONS FOR TOURISTS

The Journey to this Great Island Continent is not Long from San Francisco, and this is the Best Season in which to View its Scenic Beauties

By a Special Correspondent in Australia—Illustrated from Photos Supplied by the Government Tourist Bureau

THE progress and possibilities of a territory still in the pioneering stage of development are of especial interest to the people of a country whose history of pioneering is recent. Those Americans who visit Australia show an intelligent, practical desire to become well informed regarding the Commonwealth's industrial and political expansion, as well as an appreciation of those scenic charms that are peculiarly Australia's own.

> "To give room for wandering was it
> That the world was made so wide."

The speed and comfort of ocean travel in these days

"The Narrows," Swan River, Western Australia. On the banks of this stream are many tracts of fertile land and the cities of Freemantle, Perth, Guildford, Newcastle, Northam, York and Beverly

North Terrace, Adelaide, South Australia. The city, spaciously laid out on a level tract at the base of Mount Loftus, is divided by the Torrens River into North and South Adelaide, the latter being the business part

reduce the width of the world so much in seeming, if not in reality, that the trip from 'Frisco to Australia and back, with an interval for land travel, may be pleasurably accomplished within the limits of a short vacation. The happily and appropriately named Pacific Ocean stretches from American to Australian shores; the tropic zone which is crossed en route is dotted with lovely isles, and fair Sydney, with its pre-eminently beautiful harbor, smiles a welcome to peaceful wanderers who enter by her cliff-guarded waterway.

It is now 125 years since settlement by an Anglo-Saxon race began in Australia, but it is probable that until the year 1848 great America, so strenuously occupied with its own schemes of development, and so unreliably and irregularly informed of the character of Australia's natural resources gave very little thought to the conquest of savagery and wildness which was taking place in the island continent lying southwestward, thousands of miles away.

The great gold discoveries of California drew men to that State from all round the world. Even young Australia, for all that it had to offer to the adventurous, lost many of its hardiest native and adopted sons because of the dazzling lure of California gold. But in California, then, as everywhere in fields of chance, the rewards were not always for the most ardent and adventurous, and rich gold discoveries in Australia brought back to our shores not only many of those who had rushed to American goldfields, but also many Americans—a host of Argonauts—many of whom found at Ballarat, Bendigo or other Australian goldfields that fair fortune which had eluded them in their own land. They brought with them from a land of democracy the soul of freedom, and in that portion of Australia which has developed into the State of Victoria, some of them did not a little in the matter of shaping industrial, civic and social development.

Australia which has landscapes scientifically credited to be the oldest in the globe, and which for that reason is a country of intense interest to geologists and archaeologists, has no such colossal peaks and gorges as those of the Sierra Nevada, no tumbling torrent that can rival Niagara, no river with the volume of the Mississippi, but its scenery has distinct character, and its variety of climate and production make for immensity of charm. Its grass-covered mountain ranges and detached mountains, ruggedly crowned with battlement, cupola or minaret, have a grandeur and fascination entirely their own. Its waterfalls have an association with clear blue skies and extraordinary beauty of foliage. Its dense coniferous forests rise from rich red volcanic soil, and stretch upwards to imposing heights. Its lake districts never fail of placid charm. Its mountain streams rush in crystal clearness through rocky fern-clad gorges or wind through pleasant glens. Its ancient caves, so full of stalactic brilliance, hauntingly hold the fancy by their age and mystery. It gives a choice of mountain snow or tropic palm. Its beautiful and unique native animals opened up a world of discovery for naturalists. The bird life is vast in variety, bewildering in brilliance and sweet in matutinal song.

Americans who come to Australia now find swift railways where the Argonauts from 'Frisco once followed blazed trails; they find, too, handsome cities where once was the chaos of a primitive landing-stage or the tented squalor of a diggings. But they find, also, that though wildness has been subdued there are still places in superabundance where there is a wealth of unimpaired natural beauty, scenes where the sense of solitude and the majesty of Nature is immense.

Inland beyond the mountain ranges and agricultural table lands is a rich pastoral country—a vast harmonious and nearly level landscape finite in extent yet always conveying a sense of infinity.

Australia's coasts supply hundreds of beautiful beaches and bays for those who love to linger by the sea, and its coastal cities have beauties of architecture, park, avenue and square; but, as that much-traveled Frenchman, Pierre Loti, has noted, there is a danger of all the world appearing to be very much alike to those who see it only from artificial viewpoints—i. e., from the edges of populated countries. The typical character of Australia and the Australians is discerned more readily and appreciably by those who study the country, not only on its eastern seaboard, but who also wander North, South and West, and go inland where the varied topography and tremendous resources in primary production are associated with a people whose hospitality and naturalness are proverbial.

Taste applies to climate as much as to gastronomy and garniture. Those who think idealism in climate is associated with a snowy carpet or a frosty night may take skates or skis to Mount Kosciusko in New South Wales or Mount Buffalo in Victoria at midwinter, which in the Southern Hemisphere at this latitude occurs in June and July. The delightful island of Tasmania in its higher regions also sometimes receives a call from the snow-man, but except in a few, a very few, isolated places of high altitude the winter climate of Australia remains at a generally acceptable degree of temperateness. Tropical, sub-tropical, temperate and sub-temperate zones afford a full range of choice, and in each life is healthy and pleasant.

North Queensland offers perhaps the healthiest tropical climate in the world. It has no jungles and miasmatic swamps to make malaria, and the beauty of its foreshores, islands, straits, mountains, waterfalls and table-lands never fails to create enthusiasm. Men and women who live temperately achieve longevity as easily at Cooktown in far Northern Queensland as do the men and women in less torrid Tasmania, and they find as much pleasure in the consumption of the luscious fruits of the tropic zone as do the summer tourists in the cherries and plums of Albany, in the famous fruit district of Western Australia, or in the delectable strawberries and cream of Tasmania.

Some modern exponents of the science of medicine hold that most of man's bodily ills have had their foundation in the habit of living too much indoors. Australia is above all things an out-of-doors country, and in such a country, where outdoor sleeping is as common as sea-bathing and the Englishman's game of cricket, it is not surprising that statistics tell of a death rate so low as to be a wonder to the world.

Although its glories of color and fruitage and the volume of its waterfalls are greater in the summer, the tourist's time to visit North Queensland is in the cooler months of the year. The same statements, with modifications, apply to sub-tropical Queensland, though Brisbane people enjoy life all the year round.

The climate of the South of France in summer is akin to that of Australia south of the sub-tropics, but there is not in Australia a slow-turning climate key to make for bleak winters and laggard springs. Here the seasons smoothly merge, and winter days rarely fail of their warm tonic of sunshine.

The theory that all which now appears of Terra Australia is the remnant of a submerged continent which once had close connection with other continents may or may not be correct, but science at least can definitely state that not only is Australia geologically the oldest land on this planet, but its plant life has by a natural process of development evolved from primitive forms of vegetation, with which the vegetable life of other countries has no nearer association than that of petrified formations. Australia, like other lands, has had its spasms of primitive violence; the prevalence of rich volcanic soil, the rugged topography of some of its mountains and isolated masses of rocks, tell a story of geologic upheaval in the barred and bolted prehistoric ages.

As the tree and plant life of Australia is the oldest known, so also are its animals lively survivals of various animal tribes which in other countries passed into extinction ages ago.

Australia's wild-flower life, too, is as distinct as it is beautiful. The delightfully scented golden wattle, of which there are scores of varieties, has been selected as the nation's floral emblem. The crimson waratah is a regal bloom, which, for all its height and brilliance, does not overshadow the more delicate beauty of a host of other native blossoms.

Though there are beautiful wild blossoms in every State, New South Wales and Western Australia have the most famous wild-flower garden areas.

Rich in agricultural soils, minerals, herds, flocks and timbers, Australia as a producer in proportion to its present population, takes much pride in itself. The era of colonial hardships has passed, and it has been proved that, as regards primary production, there were no prob-

A typical Australian fern glen. In regions favored by the tropical rains the vegetation is of surpassing luxuriance and helps to build up a matted primeval forest of wonderful sublimity

lems which were insoluble. To the American visitor, especially, the Commonwealth's progress offers an interesting study in comparisons.

The history of the evolution of a powerful Commonwealth from a small colonial settlement is, briefly, one of political development, and to people who have sprung

The "Three Sisters" are a magnificent rocky promontory in the Blue Mountains, New South Wales

from the Anglo-Saxon race it is unnecessary to point out the dependence of every other sort of development on political progress and statesmanship.

Legislation in regard to occupation of land has been one of the chief keys to advancement. In Australia the "squatter" approximates to the very large ranch-owner in the cattle raising States of America, and "station" is the term applied to the land held by him. There are still many sheep and cattle stations of enormous extent in Australia, but improved Land Acts have made for closer settlement and smaller holdings, and have resulted in much increase of production and population.

The Commonwealth consists of the States of New South Wales, Victoria, Queensland, South Australia, Western Australia and the island State of Tasmania, and has control over the Northern Territory and the dependencies of Papua and Norfolk Island.

The establishment of the Commonwealth was brought about by the Federation of the States—previously known as colonies—in the year 1900. Prior to Federation, the progress of Australia as a whole was retarded by the different policies followed by the various colonial governments, in some cases the imposition of border duties making the passage from one colony to the other as subject to inquisitorial examination, as though it were proposed to pass into an enemy's territory. Since the establishment of Federation, customs duties in Australia only apply to goods coming from oversea countries.

The Commonwealth Parliament controls the Customs, Defence, Post and Telegraph, Quarantine and Coastal Lighting operations. The Federal Parliament meets in stately and handsome parliamentary buildings in Melbourne, and in Melbourne, too, the Governor-General of the Commonwealth resides, pending the establishment of an ideally laid out inland Capital to be built, according to the terms of the Constitution, at a site 100 miles from the sea. The native name Canberra has been attached to the proposed Capital, which has a delightfully bracing climate, and is situated in territory acquired by the Commonwealth in a southern district of New South Wales.

The passenger ships which plow the summer seas of the Pacific between the West Coast of America, or Vancouver in Canada, and the Eastern Coast of Australia supply travelers with all the comfort and luxury of the best metropolitan hotels. The route includes lovely island ports of call, and the voyage never fails to recuperate those who have gone close to exhaustion of their deposits in the bank of nervous supply.

The steamer fares charged by the Oceanic S.S. Co. and the Union S.S. Co. from San Francisco to Australia are: £45 first saloon single; £67/10 first saloon return; £30 second saloon single; £45 second saloon return. The Canadian-Australian Royal Mail Line charges the same rates from Vancouver to Australia.

In each of the chief Australian cities is a Government Tourist Bureau * which offers the best possible advice in regard to hotel accommodation, places of interest, etc. Hotel, boarding-house and apartment rates are considerably lower than in America for accommodation of the same class. 10/6 per day or £3/3 per week for a single bedroom with complete board is the average tariff at many first-class hotels in the cities. At others the charges are 12/6 or 15/ per day. If preferred, sleeping accommodation or partial board may be arranged for. The tariff

Leura Falls, Blue Mountains, New South Wales, are set in beautiful foliage beneath blue skies

at first-class boarding houses is lower than at first-class hotels, and establishments which rank as second-class give accommodation of a refined and superior character at very moderate charges.

* Full particulars regarding the tourist resorts of Australia may be obtained on application to the Australian Pavilion, Panama-Pacific Exposition, or from the Secretary, Department of External Affairs, Melbourne.

DETROIT—THE AUTOMOBILE CITY

The Greatest Motor Car Manufacturing Center in the World Whose Output is Now Nearly 400,000 Automobiles a Year

USUALLY it takes a long time for an industrial city to achieve international fame. Sheffield made steel and Lyons wove silk for generations before their names were linked automatically with their products. Ten years ago Detroit was little known outside of America. To-day Detroit is everywhere the synonym for automobiles. In less than a decade it has become famous as the greatest motor car manufacturing center in the world.

About 70 per cent. of all the automobiles made in America come from Detroit. Ten years ago the total value of all the automobiles manufactured there was around $6,250,000. During the present year it is estimated that Detroit will produce 395,000 automobiles and that they will be worth $400,000,000. This is practically double the output in 1913. It is this mightiness of output, coupled with mechanical excellence, that has made Detroit's name familiar on all the highways of the world.

By no means all of Detroit's product is exported, although a good proportion of it is. America leads the world in the buying and use of motor cars. At the end of last year the number of motor vehicles registered—cars on which State taxes were paid—was 1,808,441. On January 1, 1914, official statistics gave the total number of motor vehicles in Germany as 93,072. Only a small proportion of Detroit's cars are shipped direct from that city to their destinations abroad. Most of its exports to the Continent of Europe and to other parts of the globe leave the United States through New York City and other ports on the Atlantic seaboard and do not appear on the local customs books. The aggregate of this export business therefore cannot be stated accurately, but it amounts to many millions of dollars. Of the direct shipments from Detroit, Canada receives the greater part, with Great Britain next.

Semaphore system for traffic regulation

The first cars made in Detroit appeared in the latter part of 1899. They were manufactured by the Olds Company, which afterward established its great factory in Lansing, another of Michigan's automobile cities. Motor car manufacturing did not begin to assume much prominence in Detroit until 1903, and it was not sufficiently important as an industry to have a place in the census reports until the following year. In 1904, according to the United States Government's figures, there were then 19 establishments manufacturing automobiles in Detroit, and they employed 2,191 persons. In 1909 the official figures showed 68 factories with 17,437 employees.

In 1910 apparently the auto men began to come to a realization of the possibilities of their business, and to make preparations for unlimited expansion. In that year more than $1,000,000 was expended for new buildings alone in connection with the Detroit automobile industry, and the outlay for machinery and other equipment was much greater. The State Labor Commissioner's report gave 29,984 as the number of employees in auto factories in 1910. The report

One of Detroit's busy thoroughfares. The white lines on the asphalt are for the regulation of traffic—it will be noted that there is not a single horse-drawn vehicle in sight

The Wayne County Court House is an excellent example of Detroit's many handsome public buildings

for 1911 brought the number up to 45,585, distributed among 28 companies assembling cars and 66 more whose sole business was the making of parts and accessories. In 1912 the number of persons engaged in the industry in Detroit had increased to 57,293, and in 1913 it was 67,432, of whom 45,783 were employed in the 25 factories assembling automobiles, and 21,649 in the 106 factories devoted solely to the making of parts and accessories. There were also many other companies, a portion of whose business was in the latter line, but whose reports did not distinguish this from other parts of their work. This year the number of persons employed in Detroit's automobile industry is said to be 75,000.

The results of this preparatory work began to be very apparent in 1912, when the number of cars built was estimated at 130,000 with a value of $134,000,000. In 1913 a very complete canvass of the industry credited Detroit with an output of 283,000 cars, or 68 per cent. of the total product of the country. Their value was $204,000,000, or 52 per cent. of the whole. The difference in percentage is accounted for by the large proportion of low-priced cars made in Detroit.

No complete canvass was made for 1914, but there was a considerable increase in the number of low-priced cars made, a decrease in the output of medium and high-priced cars, and, in the latter months of the year, a great increase in the output of motor trucks, particularly those adapted to military use. The estimates for the 1915 production, which have been given, do not seem to be exaggerated in the face of the above figures showing the tremendous growth of the industry in recent years.

Automobiles first appeared in the export tables of 1903, when their total value for Detroit was $82,933. Five years later, in 1908, it was $338,017. In 1913 the exports of autos and their parts increased to $7,991,078. This represents only those that had Detroit as their port of departure from the United States, and formed a relatively small proportion of the total value of the city's exports of motor cars.

According to calculations made by those conversant with Detroit's automobile industry and the distribution of its product, about 80 per cent. of all the automobiles exported from the United States are made in Detroit. The factories where they are produced are vast establishments. A prominent feature of these factories is that they are light and airy, and that as much attention is paid to the health, comfort and safety of the employees as to the output. This has aided greatly in solving the labor problem, and, combined with the general beauties of Detroit, has attracted thousands of mechanics to the city. All of the Detroit plants operate every week in the year, and, when the rush season comes, try to keep up with the demand by running nights.

Many of the more than 30 factories cover more than a score of acres of ground, are from two to four stories in height, and number their employees by thousands. The largest plants are great industrial cities in themselves. Some of the plants devoted to the manufacture of accessories are of equally great area. In all these establishments the most modern machinery is used. None of it grows old. Every new invention that adds to the excellence of the output or increases its economies of time is seized upon at once and installed. It does not matter if the machinery it displaces is almost new. It has to give way forthwith to the latest improvement.

The scientific regulation of street traffic is highly developed in D etroit owing to the great number of motor vehicles in constant use. The white lines show the safety zones at the crossing of Michigan and Woodward Avenues

It is this practically insatiable desire to reach the highest standards in efficiency and excellence that has made Detroit's vast automobile factories famous the world over among experts in industry. They are one of the sights of the city which no visitor should miss. In fact, not many visitors do miss them. The factories extend a welcome and furnish guides to show them about. It is estimated that at least one-fourth of the many thousand visitors to Detroit each year come expressly to look over one or more of these ultra-modern industrial plants and to see how they accomplish their marvelous results. The invitation is general as well as particular. The literature issued by the various civic organizations of Detroit urges, in one form or another, every car owner to visit the factory where his favorite machine is made, and for those who are not car owners to see at least one of the big plants.

Detroit leads all other American cities in originating and developing the most improved methods of regulating street traffic. This is a natural outcome of its vast motor car industry and of the consequent almost universal use of the automobile.

Heavy white lines on the asphalt indicate the boundaries of the safety zones for pedestrians at the intersection of streets where traffic is heavy. Pedestrians cross with the cars between the white lines when the policeman turns the semaphore signal to "GO." When he shows "STOP," all vehicular and pedestrian traffic in the white lines facing the signal must come to a standstill.

All tramcars stop for passengers on the near side of the street. For the safety of the passengers an "island" is marked off on the pavement. Automobiles are not allowed to enter or cross this space while it is occupied by persons waiting for street cars.

A summary of the Detroit street traffic ordinances is issued by the Police Department and has a wide free distribution. Under the head of "Safety Commandments" for automobilists, this booklet says:

"Be considerate and liberal towards others using the street. Go slow when approaching children, when passing vehicles, going around corners or approaching crossings. Stop behind street cars taking on or discharging passengers, except when there is 6 feet clearance, and then move at no more than half the legal rate of speed (in business districts, 10 miles; in other portions of the city, 15 miles an hour). In coming out of driveways, move very slowly —not faster than a walk. Look ahead and keep on the alert for intersecting traffic. Use tire chains on wet and slippery pavements. Better be careful than sorry.

A bit of the Campus Martius—the Hub of Detroit—showing the City Hall and one of the new skyscrapers

"Don't run fast into or across main highways. Don't take blind curves too fast. Don't forget that a car or person may be just around the turn. Don't fail to look out for pedestrians. Don't forget that children dash out suddenly and unexpectedly. Don't take chances."

Glaring headlights are not permitted on automobiles in any of the thoroughfares of the city. The Commissioner of Police passes upon the practicability of any side or headlight and has authority to issue certificates of inspection.

All vehicles must park at an angle with the curb in business districts with a space between for passageway. No parking is permitted within 75 feet of corners where street cars stop, or within 15 feet of fire hydrants. No parking is allowed along the curb at safety zones or on crosswalks. One hour is the limit for all curb parking in the congested business districts. In wide streets, parking at an angle

A view of Woodward Avenue, in the heart of the city. This magnificent thoroughfare runs from the river straight through Detroit and in its length and the diversity of its features is one of the most notable streets in America

Courtesy Federal Motor Truck Co.

Interior of the machine shop of one of the Automobile City's great motor truck factories

Courtesy Federal Motor Truck Co.

A view of one portion of the shop where the chassis of the trucks are painted

Courtesy Paige Detroit Motor Car Co.

Small parts drill press room where thousands of drop forgings and castings are arranged

Courtesy Paige Detroit Motor Car Co.

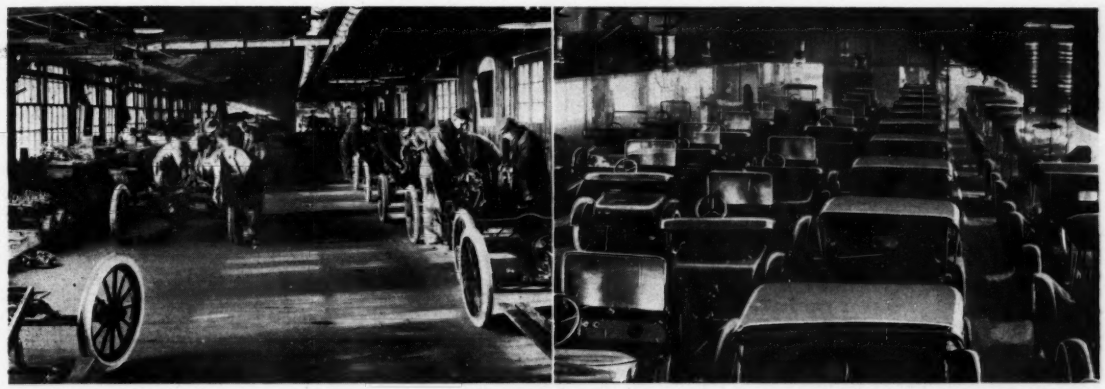
One end of the block test room in which 400 motors daily are given a six-hour block test

Courtesy Paige Detroit Motor Car Co.

View showing a corner in the motor assembly department, with a few motors ready for block test

Courtesy Paige Detroit Motor Car Co.

Frame and chassis assembly department. The capacity of this new plant is 25,000 cars per year



Courtesy Saxon Motor Car Co.

Views of two typical departments in a great factory which specializes in low-priced cars. Small cars, handsome in appearance, reliable in performance and durable, have become Detroit's great specialty in the last two or three years

of 45 degrees and one foot apart is allowed, one front tire to be against the curb.

While, out of Detroit's population of 600,000, at least one-fourth is directly supported by the automobile industry, that is not the sole important activity of the city. It also leads the world in the making of adding and calculating machines. It leads America in more than half a dozen different lines of manufactures. It has been a center of the stove-making industry for many years. Its establishments where pharmaceutical products are manufactured are of mammoth size. It also stands first among the cities of the United States in the production of soda ash and other alkalies, in india rubber products, in the output of aluminum castings, in the manufacture of varnish and in the production of overalls. In the aggregate, the city has more than 2,600 industrial enterprises. Its manufactured products are sold in every civilized country in the world.

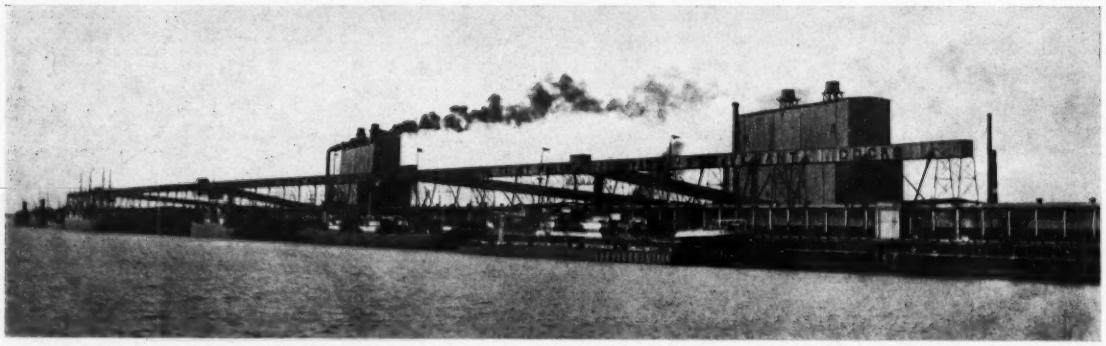
The Michigan Central Railroad's passenger station and general offices at Detroit. The tracks are below the street level

Detroit is an ancient city for America. It was founded in July, 1701, by Antoine de la Mothe Cadillac. It was then a palisade enclosure not much larger in area than the smallest of the automobile accessory factories of to-day, and was called Fort Ponchartrain. The French ruled there until 1760, when the English became masters and held it until 1796, when it was conquered by the new republic. In 1812 the English won it again, but for only a little while, and then it once more became a part of the United States. The city was destroyed by fire in 1805, which resulted in its replanning with broad streets and many public squares—features that characterize it to-day. The city is situated on the Detroit River, the narrowest part of a broad waterway that connects Lake Huron and Lake Erie. On the other side—a short ferry trip away—is Canada. The freight traffic of the Detroit River is considerable, and is rapidly increasing. The actual freight tonnage in 1913 was 85,376,705, valued at nearly $1,000,000,000. In that year the number of vessel passages through the Detroit River was 37,473, and the aggregate net registered tonnage of the craft was 62,092,149.

The Detroit River is unique among the earth's great water highways. It has no tides; it never dries up nor overflows its banks, but remains at the same level throughout the year. The harbor at Detroit, while not landlocked, is so protected that the severest storms hardly disturb the shipping. The finest passenger steamers afloat on fresh water hail from Detroit, and carry over 10,500,000 passengers a year.

One of the huge modern automobile factories that make Detroit a unique industrial city. This site covers 26 acres, and the enclosed floor space has an area of nearly 8 acres. The plant is a model of construction, arrangement and working conditions

Courtesy Hudson Motor Car Co.



Railroad terminals and steamships at the Stuyvesant docks of the Illinois Central Railroad, New Orleans, one of the great shipping points for rice, grain, etc., for the West Indies, South and Central America and Europe

SHIP CHARTERING AND INTERNATIONAL TRADE

The Essential Features of the Several Methods of Chartering Employed in the World's Ocean Carrying Trade

*By L. L. Richards Director of Bowring & Co., New York**

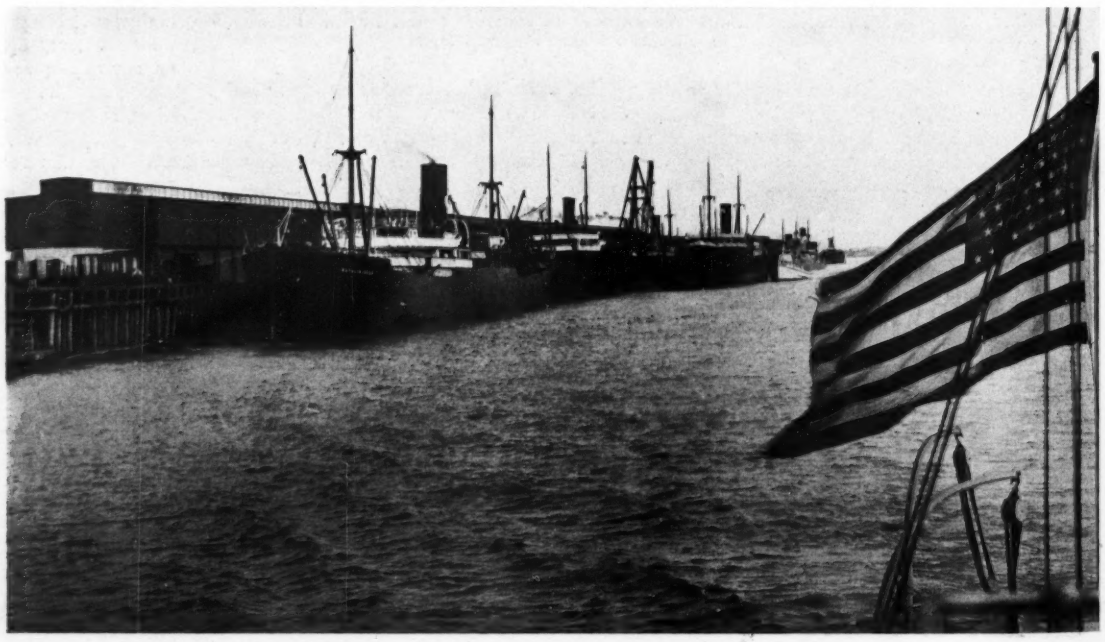
PRACTICALLY all steamers afloat are divided into two classes: liners and tramps. Liners I would subdivide into three classes: highly specialized passenger boats, like the Mauretania, Olympic or Vaterland, which rarely leave the routes for which they are designed; combination passenger and cargo carriers, such as those of the Atlantic Transport and Lamport & Holt Lines and many others; and the strictly cargo boats, many of which are specially built for carrying fruits or other perishable freight.

In this third class are most of the line services from the United States to the Argentine, China and Japan, to the Philippines and various other eastern ports. Some of these are operated by owners who have fleets of boats and are prepared to run them wherever there is a chance of working up business. Sometimes these owners establish their own offices at the various ports, and sometimes they employ agents. There are, however, many line services operated by parties who do not own the steamers themselves, but charter them for a period of time or for specific voyages, agreeing to pay the owners some stated figure. As such parties assume the responsibility of securing full cargoes and the risk of losses, they also receive all the benefit when they can earn anything over what they have agreed to pay the owners.

The greater part of the ocean transportation of the world is carried on by the second general class of boats—the tramps. The name explains itself. These boats are generally prepared to go in any direction and take any kind of cargo, the owners simply figuring up and comparing the probable results of the various voyages for which charters are obtainable and then deciding on the employment that they consider most suitable for their particular boat. These tramps are of many sizes and types. Some are so small that they have a total weight cargo capacity of only 500 or 600 tons, while others can carry as much as 12,000 or 13,000 tons. Some have only a single

* From a lecture delivered before the American Institute Course in Foreign Trade and Shipping, conducted by the Wall Street Branch of the Extramural Division of the New York University

New Orleans harbor—a bit of which is shown below—is always a busy place, but its docks are especially crowded these days with great cargo boats—many under the American flag—loading and discharging



Scene on Pratt Street wharf, Baltimore. With its fine harbor and clear course to the sea through Chesapeake Bay, Baltimore—for a century an important world port—has a large part in the new Panama Canal trade

deck; others two or three. Some have a limited passenger capacity, although as a rule they are strictly cargo boats. The ordinary tramp steamer has an average speed of about 9 to 10 knots an hour, but many are built to run up to 12—rarely over this. Many tramps are so built that they will be most suitable for some particular trade. For example, a bale of cotton takes a good deal of space, but weighs very little. In the cotton trade a steamer of large cubic capacity is wanted. Cotton charterers have no interest in the weight capacity of a steamer, as when she is fully loaded and all available spaces filled with cotton, she is still not down as deep in the water as allowed. On the other hand, in the shipment of ore, the merchant is not interested in the question of measurement, as ore that will occupy very little space will furnish a full load. Other owners build their boats with 'tween decks, some with the idea of keeping them in long voyage trades, while others favor steamers that will be the best all around type for whatever cargo is obtainable.

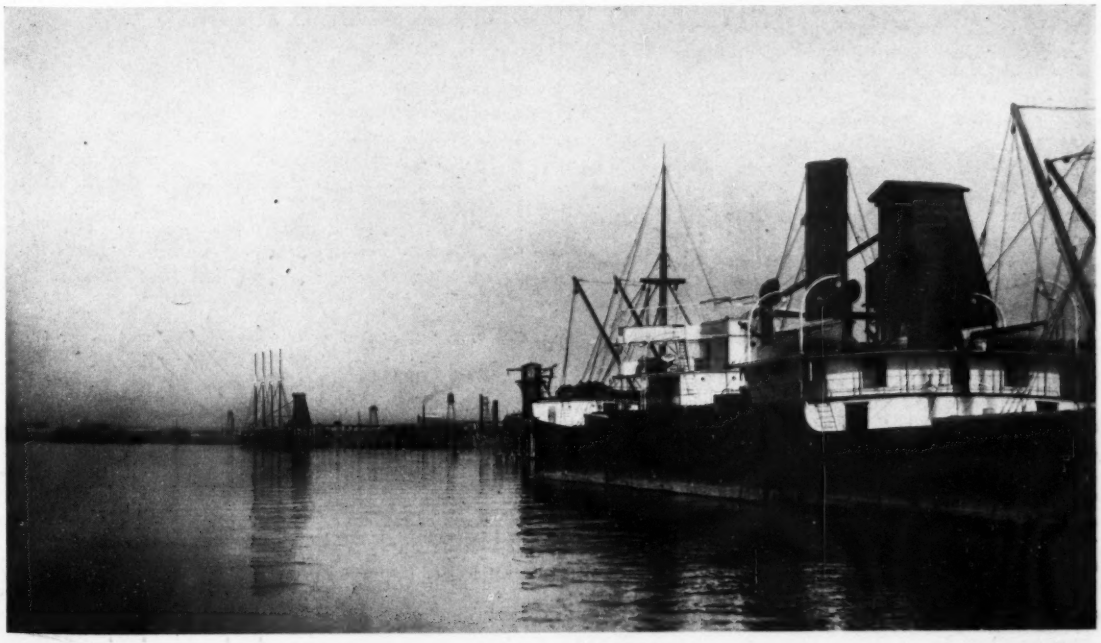
Still another special type is the tank steamer, with numerous bulkheads. Their many divisions and small hatches render these boats unsuitable for other trades, and their owners suffer losses at times when there is little demand for the transportation of oil. On the other hand, they secure high freights when there are not enough tankers to meet the demand, as a tanker cannot be built in a day or be converted from an ordinary tramp over night.

Owners differ very much in their preferences as to the trades in which their boats are to be employed. Some keep their boats busy all they can in the same class of trade; others charter for Atlantic business to-day and Pacific business to-morrow, for long voyages or short, for trip charters or time charters.

As to methods of chartering. When an owner makes a contract with a merchant under which the latter will use all the carrying capacity of the steamer, a document, called a charter party, is drawn up. This sets forth all the conditions that are to apply, and copies are distributed to the owners, charterers and the master for their guidance. Negotiations are conducted ordinarily through some shipbroker who constantly endeavors to keep informed of all steamers which are available and also in touch with all merchants who may require them. No charter can ever be concluded without one side making a definite offer to the other, subject to a reply by some stated time, usually the forenoon of the following day. Charters sometimes result very quickly, and at other times negotiations are prolonged for weeks or even months.

There is no standard form of charter party that is used in all trades, but in some there is a form that is more or less generally employed by everyone. Very often merchants have their own special forms with various conditions which they prefer to have, if possible. On account of the variety of forms and the different stipulations

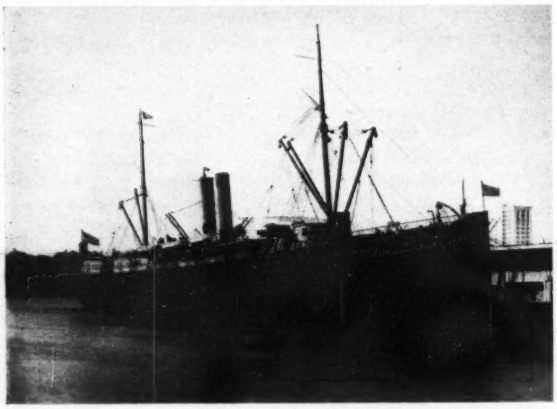
Charleston, South Carolina, has one of the most spacious deep-water harbors on the Atlantic coast, is a great railway terminus, and an important export point for cotton, rice, phosphate, naval stores and lumber



printed in them, it is always desirable in negotiations to specify some definite form of charter party.

Various methods are adopted in effecting a charter. The most common are probably either: first, individual trip charters; second, contracts for the movement of some specified quantity of cargo in some stated or number of trips; or, third, time charters.

In the individual trip charter it is generally agreed that the owner shall receive freight based upon some agreed rate on the cargo carried—so much per case of oil, per ton of ore, or bushel of grain, etc.; or, instead of such a rate, some definite lump sum for the voyage. Among other conditions that are settled are the number of days to be allowed merchants for loading and discharging cargo—these being technically known as "laydays." If the steamer is delayed beyond the number of laydays allowed, the owners receive a penalty—or demurrage—at some agreed rate for every day's delay.



Courtesy Walker, Armstrong & Co.

A type of the fast steamers that are now employed in the trans-Atlantic cotton trade out of Savannah

In such trip charters the loading port may be definitely named, or the merchant may be given an option of loading at any one of several ports mentioned, orders for which port are to be given prior to the steamer's readiness to leave her last port of discharge; or it may be arranged that she is to proceed to some port of call for orders as to her loading port. The discharging port may also be definitely agreed upon, or the merchant may be given the right of ordering the steamer to any one of the various named trade ports for discharge. It is also sometimes agreed that the merchant may order the steamer to a second or possibly a third port of discharge by paying some agreed extra rate of freight.

It is also arranged in the negotiations just when the steamer is to be ready for loading. Two dates are mentioned between which the boat must report. The first is known as the date before which laydays cannot commence; the second is known as the "cancelling date." In negotiating, the owners, merchants or broker simply state these two dates, such as, "Feb. 1 to 25," which are understood to mean that a clause must be placed in the charter party, reading: "laydays are not to commence before February 1, unless with charterers' permission, and should steamer not be ready at loading port before February 26, the charterers are to have the option of cancelling the charter party."

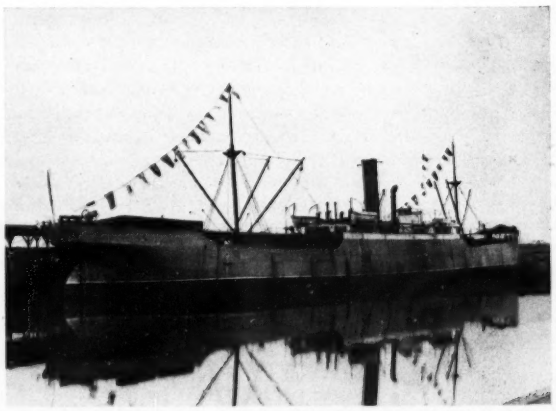
The second method I mention is that of contracts for the movement of some specified quantity of cargo in some period or number of trips. For example, one of the large steel companies on the Atlantic seaboard might wish to arrange for the purchase and delivery to them of some considerable quantity of ore at regular intervals throughout the following year. Let us take Cuba as the shipping place and Philadelphia as the discharging port. A contract may be negotiated either with some owners who have a sufficient number of steamers to put in at regular intervals to move the ore, or the contract may be made with speculating contractors who hope to charter steamers from time to time as necessary and work out a profit; or a contract may be made for some definite steamer to make an agreed number of consecutive voyages.

The third method—time charters—has steadily become more customary in recent years. It is very much like the renting of a house. The steamer is delivered to the merchants originally at some port, and the merchants then pay to the owners some agreed lump sum amount per month, this money being known as "hire." In delivering the steamer the owners furnish her with a complete crew and the boat is thoroughly equipped and ready for business, but they pay no expenses incidental to the loading and discharging of the cargo or going into or proceeding from ports, nor for the motive power of the vessel at sea—that is, in most cases, for the coals that are burned—but they must keep the steamer in good condition and furnish the necessary provisions, etc., for the maintenance of the crew and the necessary stores for the proper upkeep of the steamer.

Besides the port of delivery being agreed upon when the charter is negotiated, it is also generally stipulated what the period of the charter shall be; where the boat is to be redelivered by the charterers to the owners, and within what limits the charterers may employ the boat; the dates between which the boat must be ready for delivery and the rate of hire. These are essential stipulations in a time charter. Also it will probably be agreed in the negotiations that some certain known form of charter party shall be used.

A simple way to distinguish between the two general methods of chartering is to compare the methods of a family who at times board and at other times rent a house. In the first instance they simply pay a certain amount per head for their board, like the concern that pays a certain rate under a trip charter; in the second, they rent a house monthly from the owner and become responsible for various expenses.

In time charters there is no accepted range of trades or periods of charter. One may charter a boat to trade in closely defined limits, or may go to the other extreme and have the right of employing a steamer in any safe trade, excluding the Black Sea, Baltic and St. Lawrence out of season. The charter may be for a few months or for many years, or for whatever time is necessary for some definitely mentioned trip.



Courtesy Walker, Armstrong & Co.

One of a fleet of four vessels purchased since the war began for carrying cotton from Savannah, Georgia

The total gross tonnage of all steamers afloat is about 45,000,000. Of this nearly 19,000,000 tons are under the British flag. Next, in the order named, come the seagoing tonnages of Germany, the United States, Norway, France, Japan, Holland and the smaller maritime countries. The nationalities whose steamers are most known and chartered in all parts of the world are the English and Scandinavian. While there seems to be quite a volume of American tonnage, nearly all of this is of special charac-

ter, and very little is actually available and offering for charter for foreign business.

The movement of freights up and down is like a pendulum. There never was a market when the freights were very high but that they swung down later, often to below cost; and there was never a time when they were down but that they ultimately recovered. These are simple economic rules.

From the best statistics attainable, taking an average of the returns for ten years of many of the most representative foreign shipowners, it is found that they have not returned ten per cent. on their money. If the merchant who can employ some steamers regularly is to own the boats, he will probably be unwilling to invest unless he can see a reasonable prospect of a return of between 10 and 20 per cent., on account of the hazardous nature of marine business. Moreover, when he starts to operate the boats, it is as a side venture and incidental to his business. He cannot bring to bear on it the same broad and able experience of the expert shipowner, and will not be likely to run his boats as cheaply.

In building and owning such steamers as he requires, rather than arranging for them by charter, the merchant, if he charges up his money at say 15 per cent., is immediately penalizing his freighting with the percentage of the interest which is in excess of what the foreign owner would be satisfied with. He would also be penalizing himself with the extra cost of his own management as against that of the owner who is an expert in the business. Finally, he is saddling himself with a great deal of responsibility and worry which the foreign owner assumes for the moderate return he gets on his capital. I mean by this that such a merchant assumes all that goes with the ownership and management of boats and crews, whereas by chartering he can be free of this, and also when a boat meets with a disaster be free of the trouble of repairs, etc., and have the satisfaction of knowing that his hire ceases as soon as the boat gets into trouble and does not commence again until the owner himself has repaired the boat and returned her to the service.

A SOUTH AMERICAN FIELD FOR ENTERPRISE

The State of Amazonas, with an Area Equal to Six European Countries Combined, has Vast Undeveloped Natural Resources

AMAZONAS, the largest state of Brazil, is incalculably rich in natural products, but its commercial development, in the modern sense of the term, has only just begun. Its area—732,439 square miles— is greater than the combined areas of England, Ireland, France, Germany, Belgium, Portugal and Italy. On the north Amazonas is bounded by British Guiana, Venezuela and Colombia; on the east by Dutch Guiana and the State of Pará; on the south by Bolivia and the State of Matto Grosso, and on the west by Ecuador and Peru. Through this prodigious territory flows the Amazon—the "Sea River"—which drains a region equal to the basins of the Mississippi, the La Plata and the Orinoco. The Amazon and its tributaries are the great commercial highways, and most of the towns and cities that have arisen are on their banks.

Rubber is the principal natural product exported by the State of Amazonas, the annual output averaging about 27,000 metric tons. Other important and well-known items of export are Brazil nuts, cocoa and vanilla. Among the other products that have an international market are: Guarana seeds, valued for their medicinal qualities; cumuru, a small oily seed used in the preparation of perfumes; puxury, another seed used medicinally and in making perfumery; jarina—better known as "vegetable ivory"—a nut from a species of palm tree, used in the manufacture of buttons, chips and dice; medicinal parsley and copaiba, both used in medicine, and woods of many kinds, among them some from which fiber is obtained for use in the manufacture of ropes, paper and coarse fabrics.

Still other products that are exported in more or less volume are: horns, hair, bones, hoofs, vulture feathers, aigrettes, etc.

The present prices of all these commodities, except Brazil nuts, are lower than they have been for some time, and therefore offer an especially favorable opportunity to buyers, according to Herminio de Carvalho, a merchant member of the Junta Commercial of the State of Amazonas, who has supplied much of the data for this article. For some reason unknown to the local producers, the demand for Brazil nuts in the consuming markets is unprecedented, and the prices have risen correspondingly.

Imports into Amazonas have declined since the outbreak of the European war, owing to the same influences that have depressed commerce and industry elsewhere in the world. Merchants are buying cautiously and are keeping their stocks down, but such staples as flour, kerosene, etc., are being purchased in as large volume as usual. The imports of dry goods, notions, hardware, etc., are somewhat slower, but merchants who have attractive stocks at fair prices are doing a good business.

In Amazonas especially, rubber is considered the barometer of trade. When it is high in price, business

A majestic monument, typifying the spirit of the Amazon, stands before the National Theater

The Palace of Justice is a fine example of the beautiful public buildings adorning Manaos

flourishes; when it declines, trade decreases correspondingly. The rubber market in Amazonas has suffered considerably since 1911, owing to speculation abroad in this commodity. The "hevea Braziliense," as the Amazonas product is called, is, however, steadily in demand in international markets owing to its superior quality, and rubber growers are confident as to the future, and are expecting prices to advance materially.

The beauty of the ancient cathedral at Manaos is enhanced by the park and fountain before it

What is most needed in Amazonas, says Senhor de Carvalho, is agricultural development. Much of the State is uncultivated. Yet, the fertility of the soil is almost incredible. The forest region is of vast extent. The country is also rich in mineral products, such as coal and gold, but this natural wealth is still practically unexplored owing to lack of capital or private initiative.

Manaos, the capital of Amazonas, is on the Rio Negro, near where it flows into the Amazon. It was founded in 1669, but modern reconstruction has left few traces of its ancient past except here and there a narrow, crooked street or an old church. The city now has a population of about 50,000 and is architecturally among the handsomest cities of the American tropics.

The principal thoroughfare of Manaos is the Avenida Eduardo Ribeiro, in which are located most of the important mercantile and municipal buildings. Among the latter are the law courts and the "Theater of the Amazon." The auditorium of this theater is built in the form of a lyre and is surrounded with an imposing colonnade. As in other large theaters in the tropics, the lobbies, staircases, boxes and stalls are very spacious. There are also many open air places of amusement scattered throughout the city.

Avenida Eduardo Ribeiro, the principal thoroughfare of the city, is a thoroughly modern street

Manaos is well lighted by electricity and has an efficient tramway system. The telephone service is also unusually well developed and extended. Direct communication with the principal ports of the two Americas and Europe is had by the half-score lines of passenger and freight carrying steamers that call regularly at Manaos. Still other lines ply between Manaos and the principal towns along the Amazon and its tributaries.

CONDITIONS OF THE CHILEAN NITRATE INDUSTRY

The Foreign Demand is Heavy, but Large Stocks in Chile Awaits Shipping Facilities

A RECENTLY published statement of the Nitrate Aid Commission of Chile indicates that some depression exists in this industry owing to the suspension of work at the *oficinas*. Of the 134 in operation before the war, only 40 are reported in operation. Of these 22 belong to Chilean proprietors, while the others are the property of British, German and American companies.

According to the official figures, the production of manufactured nitrate, from January to July, 1914, inclusive, was 5,404,729 quintals of 101.4 pounds. In the six months, beginning with August, 1914, and ending with January, 1915, the total production was 17,723,510 quintals, the largest being in August—4,830,233—and the smallest in January—2,082,549 quintals.

Reference is made in the report to the anomalous position of nitrate. A great demand exists for this chemical, with heavy stocks to supply it, but without the means to convey it to consumers. Exportation decreased from an average of 5,089,792 quintals per month before the war to a monthly average of 1,915,279 quintals for the six months ending January, 1915, while the stock at the end of January was 23,758,000 quintals, the ports being described as absolutely congested with the commodity. Notwithstanding much urgent demand from Europe, prices reached a low level, owing to lack of means of transportation. In all countries, except Great Britain and the United States, according to this report, the demand was greater than the stocks available in their markets.

Freights to Europe the latter part of February, as reported by the American Commercial Attache at Santiago, Chile, were $17.63 per 22 quintals (2,231 pounds). The price of nitrates on the Chilean coast was then $1.38 to $1.40 per quintal.

A recent Yokohama newspaper reports that a Japanese firm in Kobe has received an order from the Russian Government for 9,000 tons of nitrates to be shipped to Vladivostok in April, and that on this account, and owing to other large orders from Russia, prices in Japan are advancing rapidly.

Wages in the nitrate fields have gone down 25 per cent., but falling exchange, according to American Consular advices, has increased by 40 per cent. the cost of imported articles used in the reduction of nitrates.

THE PORT OF NEW YORK

THE port of New York is the greatest port in the world. It has 445 miles of direct water front and 343 miles of wharfage available for shipping, whereas the combined wharfage ,of Liverpool (36 miles), London (28 miles) Antwerp (12 miles), Hamburg (21 miles), Philadelphia (18 miles), and San Francisco (11 miles) is only 126 miles.

The total value of the imports and exports in New York City and the corresponding figures for London, Liverpool, and Hamburg, which are the leading shipping ports of Europe, are as follows:

	Year.	Total value of imports and exports.	Net Tonnage of Vessels.	
	Year.		Entered.	Cleared.
New York.....	1913	$1,966,326,617	14,464,161	14,370,619
Hamburg	1912	1,960,779,855	13,567,913	13,837,076
London	1912	1,866,930,782	10,800,716	8,748,008
Liverpool	1912	1,816,983,279	7,253,016	7,446,873

—*Monthly Bulletin Chamber of Commerce of the State of New York.*

General panorama of the Panama-Pacific Exposition looking toward the harbor, with the Golden Gate at the extreme right. The "Tower of Jewels" dominates the other exposition structures

NATIONAL PAVILIONS AT THE PANAMA-PACIFIC EXPOSITION

Some of the Structures that are among the Most Interesting and Imposing Features of the Fair as Architectural Exemplifications of the Countries they Represent

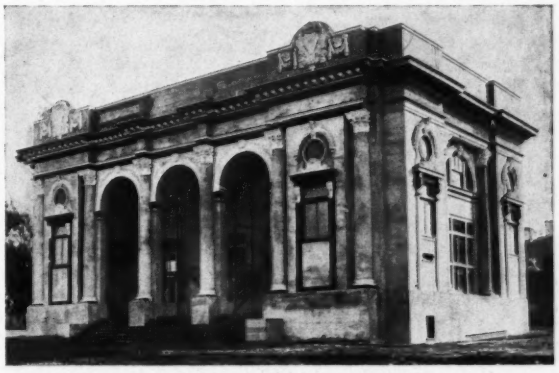
Illustrated by photos loaned by the Panama-Pacific Exposition

THE Panama-Pacific International Exposition, at San Francisco, which established a world's record on its opening day, when nearly a quarter of a million persons passed through its turnstiles, has continued to surpass in the number of its visitors all previous international fairs held in America. It has been a great success. During the coming summer it is expected that it will attract a tremendous flood of travel, not only from the United States and Canada, but from all parts of South America, the Far East, Australia, South Africa and Europe.

Now that the great exposition is in full swing, the completeness with which its original purpose has been carried out is strikingly apparent. Its purpose was to commemorate the greatest of present-day achievements—the opening to commerce of the Isthmian Canal. Therefore the exhibits from all over the world concretely epitomize the latest attainments of art, industry and commerce, as well as what they have accomplished in the last ten years. The spirit of to-day is dominant everywhere in all parts of this vast and magnificent display.

This is particularly evidenced in the architecture and adornment of the various national pavilions. These structures themselves are among the most interesting as well as imposing features of the fair.

First in size of these foreign pavilions, Canada, the northern neighbor of the United States, established another record by being the first government to have its palace completed and every exhibit installed weeks in advance of the opening day. This was due to the skill and experience of the Canadian Commissioner and his staff or assistants who have been in charge of such matters at every world's fair in which the Dominion has participated in the last 15 years. Canada's building, which cost $600,000, is designed for the sole purpose of displaying the resources and industries of that nation as a whole. No corporation or individual has anything to do with the enterprise, and no private interest is exploited. Individual exhibitors have their displays in the main exhibition palaces of the exposition.

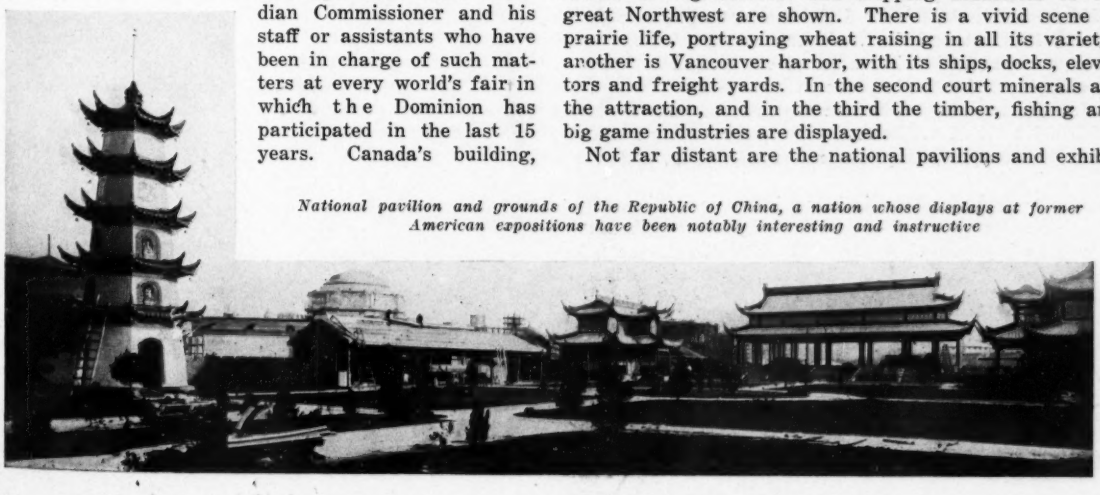


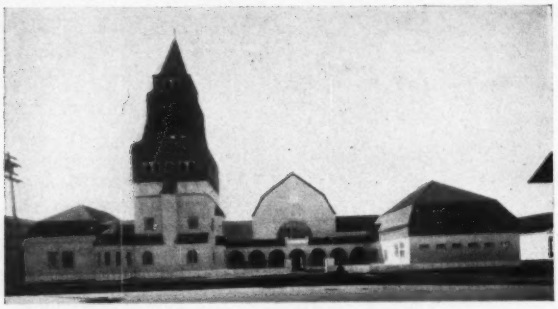
The national pavilion of Honduras, where the progress and resources of the Republic are shown

A loggia, approached by a massive marble stairway, opens upon three main courts, and is an impressive feature of the Canadian building. In one of these main courts the agricultural and shipping industries of the great Northwest are shown. There is a vivid scene of prairie life, portraying wheat raising in all its variety; another is Vancouver harbor, with its ships, docks, elevators and freight yards. In the second court minerals are the attraction, and in the third the timber, fishing and big game industries are displayed.

Not far distant are the national pavilions and exhibit

National pavilion and grounds of the Republic of China, a nation whose displays at former American expositions have been notably interesting and instructive





National pavilion of Sweden, the structures representing a characteristic type of Swedish architecture

palace of Australia and New Zealand. They stand on adjoining plots of ground and occupy a commanding site. One feature of the Australian exhibit is all manner of primary agricultural products; a zoo, with many strange animals and birds peculiar to Australia, is another. Enclosing the latter is a wonderful show of flowers and trees, including a hundred gigantic tree ferns. New Zealand's display is no less diversified. The principal mineral resources of the commonwealth are splendidly set forth. Wool in all its stages, from the sheep's back to the finished product is another feature. There is also a large exhibit of the many cereals in which the country is rich.

The Argentine pavilion is one of the most magnificent of these national edifices. It is surmounted by a majestic tower, 150 feet in height. In science, art, industry and commerce Argentina has arrayed exhibits that challenge the displays of any of the world powers.

Japan's official pavilion is a reproduction of the Temple of Kin Ka Ku Ji at Kioto. It was put together in Japan, then taken apart, shipped to the exposition, and there reassembled.

The central structure is in an immense garden, representing a transplanted section of a gorgeously beautiful Japanese landscape. Another building houses the priceless art collection of the Emperor Mutsuhito, father of the present ruler of Japan—a collection of treasures never before exhibited to strangers. For many years it was closely guarded in the royal palace and was seen by but few. In the exhibit hall are rare examples of porcelain and lacquer work, of temple bells, arms, armor, vases and other things, all of the most exquisite workmanship. The industrial life of modern Japan is shown in the main exhibit palaces of the exposition.

A 1,500-pound bell that chimes the hours and half-hours with sonorous cadences calls from afar the visitor's attention to the pavilion of the Netherlands. Five magnificent dioramas adorn this building. Three of them portray the wonders of the Dutch East Indies, and the other two the characteristic features of Holland. The gardens of this country are among the most important of the landscape exhibits of the fair. By successive plantings and by means of shrubs and bulbs of various blossoming periods, these gardens will be kept in constant bloom during the entire period of the exposition.

Italy's official buildings are particularly imposing and beautiful. They comprise eight structures, assembled about a central *piazzotta* or courtyard. The most important of these—the center or key structure—is the *Salone Real*, where all social and military functions take place.

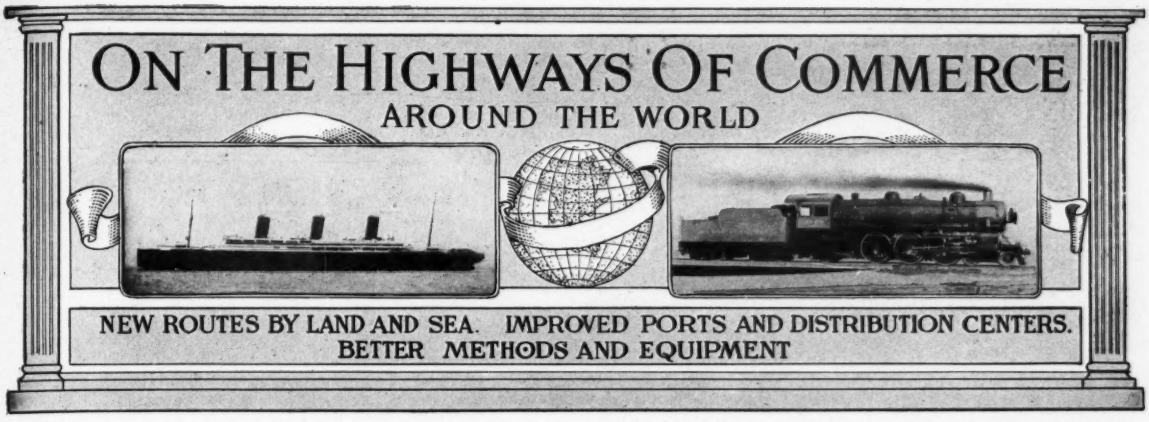
In this group of edifices are represented four centuries of Italian architecture. Busts and paintings of men who have made Italy famous adorn the *Tribuna*, the octagonal building that forms one of the group of edifices. The aim of the Italian Government and to the individual exhibitors, in the displays in the national buildings and in the palaces of industries, is to show the world what Italy is accomplishing in manufactures, arts and crafts. Its ancient achievements are shown only in reproductions.

The Italian buildings, which were dedicated April 24th, comprise eight main structures grouped around "piazzas" in true Italian style. The edifices are connected by cloisters and represent Italian architecture of the 14th to 16th centuries

The displays of its extremely varied present day activities range from silk worms slowly spinning their cocoons to models of racing automobiles.

This beautiful group of national buildings representing Italy was officially dedicated with impressive ceremonies on April 24.

The Triangle Building of the Philippine Islands. The Insular Government has, as usual, a very comprehensive display


ON THE HIGHWAYS OF COMMERCE
AROUND THE WORLD
NEW ROUTES BY LAND AND SEA. IMPROVED PORTS AND DISTRIBUTION CENTERS.
BETTER METHODS AND EQUIPMENT

GREAT COALING STATIONS AT PANAMA

Facilities for Delivering 2,000 Tons an Hour to Steamers—The Traffic Through the Canal

TWO huge coaling stations, equipped with the most modern appliances for handling fuel in great quantities, are now under construction by the United States Government at either end of the Panama Canal. It is expected that they will be completed and in operation by the end of the present year.

These stations are designed primarily for the American navy, and a minimum supply of 300,000 tons of coal will be kept on hand at all times. The Government will also sell coal to merchant vessels, and it may lease a part of the plant on the Atlantic side to private interests, charging a fixed rate per ton for storage and handling.

The larger plant is at Cristobal, on the Atlantic side. It consists of a steel and concrete basin 1,000 feet long and 250 feet wide, with a storage capacity of about 290,000 tons. The Balboa plant, at the Pacific end, is 500 feet in length, and will hold approximately 160,000 tons. This gives a rated capacity of 450,000 tons, but this could doubtless be increased to 500,000 if the facilities now in use were continued.

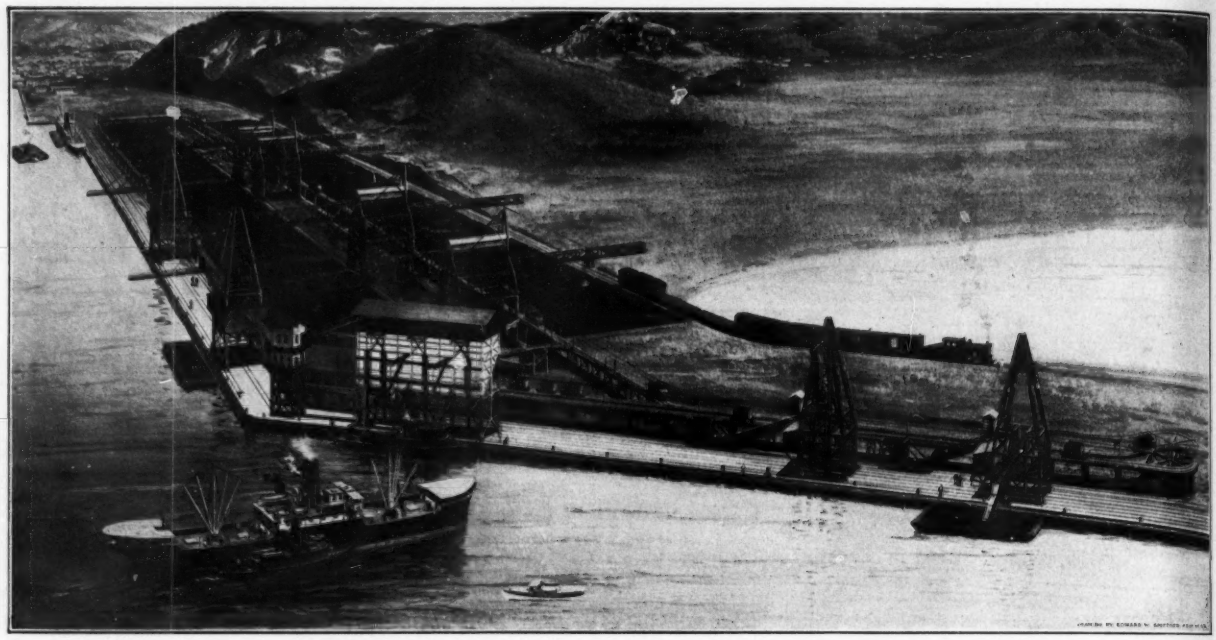
The machinery of the Cristobal plant will be capable of unloading colliers at the rate of 1,000 tons an hour, and of delivering coal to steamers at the rate of 2,000 tons an hour. The usual speed at which vessels will be coaled, however, will be about 1,000 tons per hour, according to *The Coal Trade Journal* which furnishes the foregoing data.

The coal is brought by Panama Canal colliers from Norfolk and other great terminals on the Atlantic coast. Each of these boats has a capacity of about 12,000 tons. Coal is at present supplied to merchant vessels at both Cristobal and Balboa at the rate of 600 to 750 tons a day. Deliveries are made either from lighters or from cars alongside the wharf. The price of coal is $1 a ton more at Balboa than at Cristobal.

The latest statistics at hand covering traffic through the Canal are to the end of March. In that month a total of 136 seagoing vessels passed through this waterway, carrying an aggregate of approximately 635,057 tons of cargo. This is between one-third and two-fifths more vessels than had used the Canal in any preceding month, and 186,100 more tons of cargo than had passed through in a previous month, exceeding former records by over 40 per cent. The average daily transit of cargo during March was 20,485 tons, as compared with 15,164 tons in February.

The coastwise east and westbound cargoes amounted to nearly one-third of the total movement for the month, and those from the Pacific coast of the United States to Europe to about one-sixth. The westbound ships from Europe to the Pacific ports numbered only 4 and their cargo tonnage 7,097. Nine ships passed through from the United States to South America. They carried

Panoramic view of the coaling station at Cristobal, on the Atlantic side of the Panama Canal, which will be completed by the end of this year and will have a storage capacity of about 290,000 tons



Panoramic view of the Balboa coaling station, Panama Canal, capacity 160,000 tons, which, with the station at Cristobal, will supply the American navy and the merchant vessels using this great highway

53,506 tons of cargo. Steamers from South America to the United States were 17 in number, and their cargo amounted to 100,705 tons. The South and Central American cargoes bound for Europe totalled nearly 67,000 tons, while those passing in the other direction were only a little more than 4,500 tons. From the United States to the Far East there were 8 vessels with 48,499 tons of cargo, and in the opposite direction, 3 steamers carrying 23,600 tons.

Cargo declarations by the masters of vessels listed 88 commodities. The principal ones were: barley, from the Pacific coast, mostly to Denmark and Norway; coal, from Atlantic ports to South America and the U. S. Pacific coast; lumber from the west coast of North America, about one-third of it bound for Great Britain; iron and steel manufactured goods from the Atlantic seaboard to South America and the Northern Pacific coast; railroad material from New York to South America, Japan and New Zealand; nitrates from the west coast of South America—32,000 tons to Europe and 79,000 to the United States; sugar, from Hawaii to the Atlantic coast, and from South America to Europe.

The largest single user of the Canal thus far is the American-Hawaiian Steamship Co. From the opening of the canal, on August 15, to April 1 of this year, vessels of that line made 94 transits of the Canal, carrying an aggregate of 699,342 tons of cargo, more than one-fifth of the total for that period. The average was 7,440 tons per vessel. All but three of these vessels were in the coastwise trade. These three were carrying Chilean nitrates to the United States.

Up to March 1 the earnings of tolls on vessels using this waterway fell short of meeting the expenses of operation and maintenance of the Canal by $261,098.09. From the beginning of the present fiscal year, on July 1, 1914, to March 1, 1915, a period of 8 months, the total expenditure attributed to operation and maintenance was $2,595,613.33. The total earnings of tolls in that period were $2,334,515.24, or a loss of approximately 10 per cent. The tolls earned during March amounted to $560,784.96. The cost of operation and maintenance for March have not yet been summarized, but it is calculated that they will not exceed $425,000. This would reduce the loss since the opening of the Canal to about 4 per cent. Under normal conditions the income from this great waterway will considerably exceed its operating expenses and fixed charges.

ICELAND'S COMMERCE WITH AMERICA

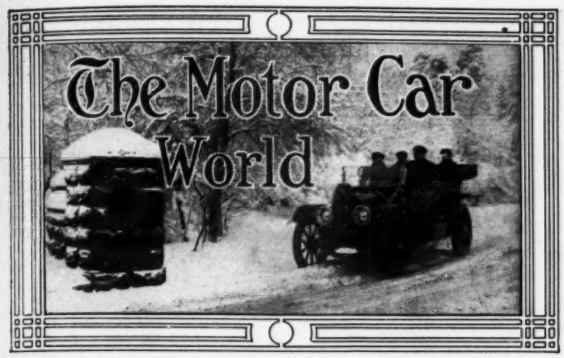
A New Steamer to be Put in Service Between Reykjavik and New York

THE new Icelandic Steamship Company has decided to send their steamer *Gullfoss*, which is nearing completion at Copenhagen, direct to New York about the middle of April," wrote J. Thorsteinsson, a subscriber of the INTERNATIONAL REVIEW at Reykjavik. "This boat was originally intended to ply between Reykjavik, Leith, Hamburg and Copenhagen, but owing to the war and the difficulty of obtaining goods at those ports it has been decided to send this ship to America. This will be a step toward direct steamer service between America and Iceland, which is much to be desired. The distance between these two countries is short, and Iceland imports all grains, etc., consumed there. The only difficulty might be in opening a market in America for the products of Iceland."

The *Gullfoss* is the first ship owned by Icelanders that has visited America in about 900 years—since the discovery of Vinland by Lief Ericsson, son of Eric the Red, in about the year 1000. This formerly was considered a tradition, but is now regarded as having an authentic foundation. The arrival of the *Gullfoss* in New York, early in May, therefore, was considered a memorable occasion. It was celebrated by a dinner given for Captain Peterson and the crew by 60 natives of Iceland. The *Gullfoss* will take back a cargo of about 900 tons, chiefly of flour.

The island of Iceland is a colony of Denmark, situated between the North Atlantic and the Arctic Oceans, 155 miles southeast of the nearest point of Greenland, and 570 miles from the coast of Norway. It is a pastoral country and many cattle and sheep are bred there. Except a few oats and a wild grass, whose seeds are used for food, no grain is raised. There are few manufactures.

Iceland's principal article of export to the United States is wool. Other items are mackerel, fur skins, laces and embroideries, guano and other fertilizers. The total value of American imports from Iceland in 1914 was $86,113. The exports from the United States to Iceland, in the same year, totaled $15,855 in value, and consisted of grains and a variety of manufactured articles. Iceland's purchases in the past have been more largely from Denmark, Germany and England, and have comprised boots and shoes, leather, canvas, rubber, sailcloth, waterproof garments and gasoline.



MOTOR BUSES AND "JITNEYS"

The Rapidly Widening Use of these Increasingly Popular Methods of Passenger Transportation

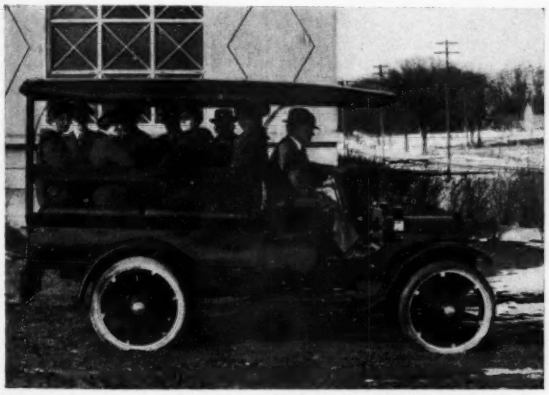
THE extensive introduction of five-cent fare motor vehicles in the United States is bringing about an appreciation of the worth of bus service in general. The value of such vehicles as passenger carriers has been realized for some time, particularly in the great cities of Europe. In London, for example, omnibuses carried nearly 734,000,000 persons in 1913—nearly twice as many as in 1910, almost as many as were transported by the tramways in 1913, and 60 per cent. more than were hauled by the local steam railways in that year. When the war began, the majority of horses and motor vehicles in England were commandeered for military use. Since then British merchants, bus companies and others have been importing large numbers of American cars to take the places of those of which they have been dispossessed. These have given such excellent service that they promise to be permanently employed in future. The same is true in France and in other countries abroad.

In America the demand for cars that can be used for carrying passengers for hire is increasing with much rapidity. At present about 5,000 motor vehicles of all kinds are being used in what is now generally called the "jitney" service. Bus associations are being formed in many cities and states for the control and regulation of this traffic. In the State of Rhode Island, for example, the Jitney Bus Association, which operates about 650 cars, has made some recommendations to the local authorities that are along the general lines of what is being done elsewhere. They are of interest to those who are contemplating the inauguration of bus services abroad, as they show some of the safeguards that experienced owners deem necessary for protecting both themselves and the public. The adoption of similar regulations has done much to remove the objections that have been raised to the introduction of the "jitney" service in many cities.

This bus association proposed an annual license fee and bond for each car operated, the latter to serve as a guarantee for the payment of damages in case of injury to persons through the fault of the jitney drivers. It suggested the adoption of stringent rules to insure the employment of none but competent chauffeurs, and fixed an age minimum of 20 years.

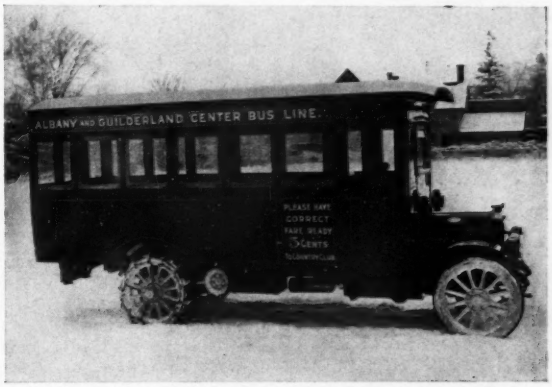
In Canada, the "jitney" service recently has moved east from Vancouver and Winnipeg, and is now established in Toronto. It is also seeking to gain a foothold in Hamilton. After an experiment of a few weeks in a popular residential district that was not well supplied with tramway facilities, the Toronto Jitney Association placed motor cars on two important business thoroughfares. This has proved so successful that the extension of the service is in progress. As in many other cities, automobiles are used in this service, the cars running at frequent intervals during the earlier morning and later afternoon hours, and less frequently in the middle of the day.

The use of motor omnibuses and other low fare vehicles has also spread to South America. Two or three months ago, according to the *South American Journal* (London), the Valparaiso Tramway Company decided to increase fares 50 per cent., owing to the fall in the rate of exchange. The public strongly objected to this and forthwith a large number of automobiles, of all sorts from the small pleasure car to the slower moving truck, appeared on the streets for hire at tramcar rates. Subsequently a national motor omnibus company was formed with a capital of $1,200,000 for the purpose of supplying Valparaiso with a complete service of modern auto-buses. Thirty vehicles will be bought at once, and the number will be increased according to traffic requirements.



Courtesy Dart Motor Truck Co.

This style of jitney bus has been widely purchased by individuals and bus corporations in the United States



Courtesy Federal Motor Truck Co.

A popular type of jitney bus that is extensively used in New York State for five-cent passenger traffic

MOTOR CYCLES IN RUSSIA

Preference Expressed by a Moscow Club—Large Increase in Sales of American Makes

THE Moscow Motor Cyclists' Club, one of the largest and most influential organizations of its kind in Russia, recently asked its members 12 questions, the most important of which were: "What machine did you ride last season?" "What machine will you ride next season?" "Which do you consider the best—English, French, German or American machines?"

The answers showed that of the machines ridden by the club members in 1914, 38 per cent. were English, 25 per cent. German, 16 per cent. American and 21 per cent. other makes. As regards the make of machine decided on for this summer, 53 per cent. were in favor of English models, 13 per cent. were undecided between English and American, 11 per cent. had made up their minds to buy American machines, 6 per cent. wavered between English

or French, and 1 per cent. between American or French, while 3 per cent. had fixed on a French model.

In commenting on the above a writer in the *British Export Gazette* says that it must not be forgotten that the preference for British machines is modified by the opinion that they are subject to certain necessary improvements in general construction.

As to details of the requirements the preferences of the members of the Moscow Motor Cyclists' Club were expressed as follows: 55 per cent. favored from 3 to 4 h. p.; 33 per cent., 4 to 7 h. p., and 4 per cent. 2 to 3 h. p., while 49 per cent. of the demand was for side car combinations. The preference for 3-inch tires was 60 per cent., and for 2½-inch tires 30 per cent. of the total; while 23 per cent. of the voters were in favor of 28-inch wheels.

Russia's imports of American motorcycles have been increasing at a rapid rate. In 1913 they comprised 85 motorcycles, valued at $17,819, while in 1914 the number of machines rose to 408, amounting to $75,505. All these were for European Russia.

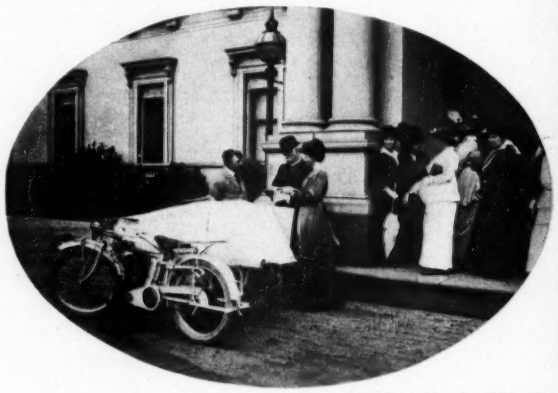
THE MOTORCYCLE AMBULANCE

An Original Type of Vehicle which Represents the Invasion of a New Field of Usefulness

THE motorcycle has been much used in the present war for the mounting of rapid fire guns as well as for scouting and the carrying of dispatches. Only lately, however, has it been adapted to ambulance purposes.

This new field that the motorcycle has invaded is a wide one outside of military utility. The motorcycle ambulance is designed expressly as a hospital auxiliary for the use of private or public institutions. The chassis on which the cot is carried is of standard construction and can be attached without the use of special fittings. As the accompanying illustration shows, the cot is portable, increasing its efficiency to the maximum. When in position on the chassis, it is supported by the spring cross arms, and is securely fastened by heavy split pins which are automatically retained.

Maple constitutes the framework of the cot, which is 6½ feet in length and 2 feet wide. White duck is the supporting material between the frame sills, which are covered with khaki.



Courtesy Hendee Mfg. Co.

Her Excellency Lady Helen Munro Ferguson receiving a motorcycle ambulance of the Australasian Red Cross Society

Full protection is afforded the occupant of the cot by a collapsible hood and slip cover of weatherproof khaki which completely encloses the berth. A celluloid window permits the entrance of light, and the air supply to the occupant can be regulated by an adjustable flap with snap fastenings.

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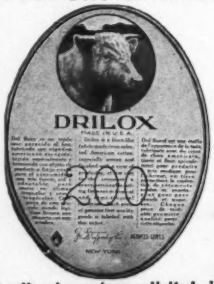

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INTERNATIONAL TRADE CONDITIONS

ARCHANGEL AND VLADIVOSTOK IN WAR TIMES

Shipping Conditions at these two Important Ports of the Russian Empire

THE port of Archangel was considered of so little importance in the commerce of Russia, prior to the present war, that it had no adequate wharf facilities, not even a single unloading crane. It is on the White Sea, well toward the extreme northern confines of the Empire, and is connected with the rest of Russia by a single-track, narrow-gauge railroad, 360 miles in length, running to Vologda. Ice usually closes this port from October to the middle of June. This year, however, owing to the imperative necessities of trade, the harbor was kept open until February 13, on which date a steamer that had arrived from New York, departed with cargo for England.

When the Baltic ports were closed at the beginning of the war, Archangel assumed unwonted importance as Russia's only port open directly to western Europe. It was quickly swamped with freight. As many as 16 ships arrived in one day.

"On account of the absence of proper docks and cranes," says an American consular report, dated dated February 6, "most ships arriving in Archangel during the winter drew up close to the town and allowed themselves to freeze in, and then unloaded with their own cranes onto the ice. The ice was then broken to release the ship and the goods could not be transferred to the railroad, which is on the opposite bank of the Dwina, until new ice formed.

"These goods are piled in the vacant lots of the town and in nearby fields. The warehouses existing at the outbreak of the war were sufficient only for the requirements of an important fishing center. The freight now lying at Archangel would keep the narrow-gauge Archangel-Vologda Railroad busy at its extreme capacity of 120 cars per day for the next year and a half. Most of the goods now at Archangel are consignments to the Russian Government.

"Work is being pushed as fast as possible on the construction of a single-track line of the standard Russian gauge parallel to the present narrow-gauge line. This is to be in running order by next August from Vologda to a little less than half way to Archangel. Goods will be transshipped from the narrow to the standard gauge cars, and will double the carrying capacity of the line. It is planned to have a double-track, standard-gauge line through to Archangel, to construct an outer port and to increase the dock facilities."

The key to assuring Russia a port which will be free of ice the whole year, and which will afford direct access to Atlantic ports, according to a recent statement of the American Consul at Petrograd, is now admitted to be in Lapland, between Alexandrovsk and Kola, on the north shore of the Murman Peninsula, where there is a bay running 27 miles inland from the Arctic Ocean. It lies 170 moles southeast of the North Cape and comes within the influence of the warm current from the Gulf Stream which flows along the coast of Norway and sweeps around the North Cape, continuing into the Arctic Ocean. This bay never freezes, and the temperature of the air averages 30° F. warmer than the forests and tundras of Lapland, 30 miles to the south. The construction of a port there and the building of railway connections with the lines leading to Petrograd and to Finland would give Russia direct rail and water communication with the western world throughout the year, independent of political conditions in the Baltic and Black Seas.

Away at the other end of Russia, at Vladivostok, on the eastern shore of Asia, the Russian Government is enlarging with the utmost energy its port facilities on the Pacific, preparing to export through Vladivostok 350,000 tons of wheat from Siberia. Vladivostok has no facilities for handling such an amount of cargo, but as it is the only port from which the shipment can be made, temporary moorings and storehouses are being constructed. Warehouses covering nearly 200,000 square feet are to be finished by April 1, despite the difficulties due to the rigors of winter. This will be more than double the present warehouse capacity of the port.

It is estimated that about 50 ships and two months' time will be required to carry away this 350,000 tons of grain. The American Consul at Vladivostok reported under date of February 20 that a large number of British ships had arrived there from New York via the Panama Canal, and that the wharves were all occupied. The past winter has been unusually severe, and the ice field extended farther out to sea than usual—sometimes 30 miles. The ice-breakers, however, were able to keep the harbor and the channel open.

The production of phosphate rock in the United States in 1914, as shown by the quantity marketed by States, was 2,734,043 long tons, valued at $9,608,041. The production of the preceding year amounted to 3,111,221 long tons, valued at $11,796,231, so that there was a decrease in 1914 of 377,178 long tons, or 12 per cent. in quantity and of $2,188,190 or 19 per cent in value. W. C. Phalen is authority for the statement which has just been made public by the United States Geological Survey.

EXPERIENCED SELLING AGENTS WANTED

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AMERICAN EXPORTS LARGE AND VARIED

Miscellaneous Shipments for Russia and Denmark, and a $750,000 Flour Consignment to Europe

RECENT commerce reports give some indication of the great variety and volume of American merchandise that is now being sent abroad. The steamer *Mongolia*, clearing from San Francisco, January 9, had among its cargo 30,000 pounds dried fruit and 300 boxes fruit for Vladivostok; 550 bales cotton for Russia in Europe; 3,000 cases salmon for Singapore; 6,506 pounds beans and 1,097 pounds peas for Hongkong; 3,775 pounds dried fruit, 1,825 pounds prunes, 1,001 pounds raisins, 420 pounds beans, and 100 gallons wine for China ports; also smaller amounts of dried and canned fruits to Japan, Chosen (Korea), Java, India, and Malay States. The same steamer carried to the Philippines 10,803 pounds beans, 1,028 boxes fruit, 1,590 cases canned fruit, 1,312 pounds dried fruit, 2,510 pounds prunes, 19,950 pounds raisins, 20 cases grape juice, 43 cases honey, 80 cases olives, 180 cases pickles, 1,627 pounds seed, 56,160 pounds tobacco, 52 packages vegetables.

The steamer *Fionia*, clearing from San Francisco February 19, carried among its cargo for Denmark 88,000 pounds apricot kernels, 90,109 centals barley, 22,200 pounds dried fruit, 207,050 pounds dried apples, 672,502 pounds dried apricots, 521,685 pounds dried peaches, 36,025 pounds dried pears, 600 boxes apples, 350 boxes oranges, 25 boxes lemons, 39 boxes pears, 10 boxes grapefruit, 50 cases honey, 810,250 pounds prunes, 349,225 pounds raisins, 2,945 pounds vanilla beans. For Sweden: 9,600 pounds beans, 195,200 pounds dried fruit, 321,000 pounds dried apples, 42,625 pounds dried apricots, 1,375 pounds dried peaches, 1,375 pounds dried pears, 554,950 pounds prunes, 172,425 pounds raisins. For Norway: 1,375 pounds dried fruit, 12,500 pounds dried apples, 48,125 pounds dried apricots, 1,375 pounds dried peaches, 27,500 pounds prunes, 88,745 pounds raisins.

A milling company in the Middle West has completed the shipment to continental Europe of one of the largest flour orders yet received. It totaled in value about $750,000 and required 512,000 bushels of wheat. The flour was shipped to New York in 400 railroad cars, and two special ships were chartered by the buyers, who paid for the flour at the seaboard and assumed all responsibility for the ocean shipment. Wheat flour exports from the United States totaled $10,028,737 in January, 1915, against $4,752,500 in January, 1914. Exports in February, 1915, totaled in value $8,962,160, against $3,603,828 in February, 1914.

PHILIPPINE EXPORTS AND IMPORTS

Effects of the European War Shown in Changes in Trade Movements

THE Philippine commercial outlook, at the beginning of 1914, was for a large increase in the volume of exports and imports. These anticipations were fully realized in the earlier months of the year, which showed an increase of about $2,000,000 in imports and $6,500,000 in the export total over the corresponding period of 1913. Subsequently, however, the effects of the war in Europe were felt in these islands, although perhaps in a somewhat less degree than elsewhere in the world.

The falling off in imports was chiefly in cotton cloths and in iron and steel products, according to the official reports. About three-fourths of the volume of these products are imported from the United States. The coal trade increased, but was less exclusively from Japan. Australian shipments were larger than in 1913.

Imports of fresh beef were less than in the previous year, but this was largely due to the increased local production of cattle. Australian cattle, however, were imported in larger numbers than formerly. Philippine purchases of refined sugar also declined coincident with increased local production of superior grade of sugar. The sugar industry, after two years of unfavorable crop conditions, showed results of increasing acreage and improved methods by exports which were considerably above the highest figures reached during the American occupation. There was but slight improvement over the low average price of sugar in 1913, high war prices having but little effect as the bulk of the crop was marketed before August 1. The industry, however, has been put in a more favorable position for the purchase of modern mill equipment. There are now in operation some 15 recently installed mills capable of producing high grade sugar, and the standard is being raised by the reduction of wastes which formerly prevailed owing to obsolete methods in use.

Unfavorable conditions in the copra industry continued during 1914, but the reduced exports of this article were largely offset by a new trade in cocoanut oil developed since 1912. This oil trade is the product of a plant recently installed at Manila, and the new industry outstripped all minor export industries. The establishment of another plant of larger capacity is in prospect, and the outlook for further increase in the exports of cocoanut oil are considered favorable.

In the distribution of Philippine trade by countries in 1914 the United States was credited with half the total value of both exports and imports, the considerable increase in the proportion of exports being chiefly due to the resumption of sugar shipments to the American market. In addition there was a trade of some importance with Hawaii, largely made up of imports of coffee and exports of cigars, and a small but growing general export trade with Guam following improved shipping facilities.

Among the important commodities and articles of merchandise imported by the Philippines are cement, automobiles, thread, wearing apparel, yarn, corrugated roofing, illuminating oil, boots and shoes, condensed milk and paper and its manufactures.

PROSPECTING FOR RADIUM IN JAMAICA

Indications Point to the Presence of this Valuable Mineral on the Island

THE discovery in Jamaica of pitchblend, which is recognized as one of the signs of radium deposits, has led to the belief that this precious substance exists in certain parts of that island and that further investigation may result in its being found. An Englishman traveling in the hill districts investigating the mineral possibilities of Jamaica is reported to have come across certain indications which induced him to conclude that radium might be found in the neighborhood. Having secured the necessary permission from the owners of the land, he began a more systematic search which resulted in his finding pitchblend and, later, certain deposits which he regarded as containing radium. These have been forwarded abroad for analysis and upon the report of the chemists it will be known whether or not this element exists in the island.

One of the local papers commenting on the matter, remarks that "the evidence appears to be very strong that a valuable deposit has been discovered; and all the indications appear to support the belief that it is the material from which radium is derived.

TRADE CONDITIONS IN BRAZIL

Business Improving in all the States not Dependent on Rubber or Coffee

(From the Branch Office of R. G. DUN & CO., *"Jornal do Brasil" Building, Avenida Rio Branco 110-112, Rio de Janeiro, Brazil)*

THE following report of trade conditions in Brazil shows the state of affairs at the end of December of last year. The values of exports and imports are in milreis. A Brazilian milreis, at the present rate of exchange, is worth a little more than 25 cents United States currency. For the information of those unfamiliar with Brazil, it may be stated that it lies entirely within the tropical and south

temperate zones; that its area is about 200,000 miles greater than that of the continental United States, and that its population is 20,515,000, or about 6.4 per square mile—one-fifth that of the United States proper. It will be noted from the report that the Brazilian States whose principal export products are rubber or coffee have been less prosperous of late than those producing sugar, cotton or cereals. This is owing largely to the depression in prices of the former commodities and to the increased demand for the latter, due in a great degree to the changes occasioned by the war.

Manaos, the commercial center of the State of Amazonas, is some 2,000 miles from the mouth of the Amazon. The products of this state—practically all rubber—exported through this gateway in 1912 were valued at 118,195,060 milreis. The imports of merchandise amounted to 22,940,146 milreis. Due to the heavy decline in the price of rubber, the values of exports and imports in 1914 were much less. The importing houses, which, as a rule, are extensively interested in the exportation of rubber, are reported to have much of their capital tied up in this commodity, and to have suffered considerable losses from its fall in price.

The State of Pará—of which a city of the same name is the capital—exported in 1912—a prosperous year in Brazil—products to the value of 116,112,152 milreis. The amount of the merchandise imports was 47,377,541 milreis. The principal products of this State are stated to be rubber, cacáo and nuts. The production during 1914 was normal, but the prices realized were much reduced. Many houses are reported to have suffered from the heavy decline in rubber upon which the prosperity of the State depends. The present commerce is said to have had time to readjust itself somewhat to the continued depreciation in the value of its staple commodities and the low prices that have prevailed in other lines of export, but importations are stated to have diminished about 50 per cent., and that, for the present, there are no indications that they will increase. Stocks are reported to be much reduced, especially in the line of provisions. It is stated that collections, while retarded—due to the moratorium—are not unfavorable, particularly on transactions not affected by this act. The demand is said to be strongest in provisions.

The commerce of the State of Maranhão—of which a city of the same name is the capital—was, in 1912: exports, 9,539,564 milreis; imports, 9,986,658 milreis. The production is stated to be cereals, manicoba rubber, cotton, hides, etc. Exports it is stated locally were about one-third those of 1912, with prices somewhat lower. It is reported that the merchants have met the financial crisis of the past year and a half with relatively few failures, and that they are operating at this time very cautiously. Importation has much decreased, owing to the reduced demand, and stocks are said to be low. Capital is tied up with the long time credits conceded customers throughout the interior. It is said that the merchants of the city of Maranhão should be in a favorable position to increase their stocks following an improvement in the financial condition of the country, as the general state of the commerce of the city has always been healthy.

The exports of the State of Ceará (capital Ceará) were, valued, in 1912, at 10,928,404 milreis, and the imports, at 12,842,079 milreis. This State exports to foreign countries and to other parts of Brazil cotton, hides, rubber, some coffee and some cereals, but the demand during 1914 is stated to have been much reduced—not over 25 per cent. of what it was in 1912—and the prices low. During the last year and a half, despite the depression in trade, commerce has withstood the pressure unusually well, few failures of importance being reported. It is said locally that a return of prosperity will follow upon a resumption of exports on a normal basis. Stocks and importations are reported to be much reduced. The provision trade is said to have suffered most, with dry goods, hardware and boots and shoes in a more favorable position. Rio de Janeiro merchants report little business at this time with the four States mentioned above.

The foreign exports in 1912 of the State of Pernambuco, of which the city of Pernambuco is the chief commercial center, were valued at 13,893,211 milreis, and the imports, 48,842,079 milreis. Sugar is the principal product of this State, with cotton second, and cereals, etc., following. As Pernambuco and the adjoining smaller States of Rio Grande do Norte, Parahyba and Alagoas have not been affected by the rubber and coffee market conditions, it is reported that trade during the past year or so has not fallen much below normal, although the general financial stringency has affected collections to a considerable extent, but not so unfavorably as in some other sections. At present it is reported that the sugar crop is being marketed at favorable prices, with cotton being held for better market conditions. The price of cotton is ruled by Liverpool, but the consumption is practically all local. The various products of these States as a whole are said to find a fair market, and trade conditions, while not normal, are fairly satisfactory. Few failures have been reported among the importing houses, and altogether the commerce of the city is said to be in a healthy condition. Collections throughout the interior of the States are said to be affected by the moratorium, but in general are satisfactory. The wholesale trade is granting much shorter credits, and sufficient stocks have been maintained to meet the demand. Rio de Janeiro houses say that they find business here satisfactory.

Bahia—State and city—exported 67,772,535 milreis' value, in 1912, while the imports amounted to 51,965,023 milreis. While one of the exports of this State is coffee, the better prices obtained for its other exports, such as tobacco, cacáo, cocoanuts, etc., has enabled it to sustain a fair trade movement. Few failures are reported during the last 12 months, and while merchants have had the usual difficulty with collections in the interior, it is said that obligations have been met with satisfactory punctuality. Since the beginning of the European war exports have been somewhat seriously retarded on account of the cutting off of the German market for cacáo and tobacco. Rio de Janeiro houses at present class the Bahia market as fair. Stocks are said not to be much below normal and ample for the present trade movement.

The city of Rio de Janeiro's exports in 1912 amounted in value to 158,918,719 milreis, and the imports to 371,194,687 milreis. This city dominates the exports of the important States of Rio de Janeiro and Minas Geraes. This trade consists chiefly of coffee, the price of which has been low and has had an important bearing on the commercial movement of the capital. The production of cereals, sugar, etc., has counteracted this depression to a certain extent. The trade throughout the interior is referred to as quiet. The percentage of retail failures has not been excessive. In the city of Rio de Janeiro there have been few failures among the old established houses, and those on a less firm basis have stood the pressure well. For the most part, such failures as have occurred have been among firms whose tendencies have been too venturesome or speculative. Stocks are reduced, but are sufficient for the existing trade movement, and importation is low. The wholesale houses report a much lessened movement with Minas Geraes, Rio de Janeiro and Bahia, but a more favorable trade with Pernambuco, and almost a normal improvement with Rio Grande do Sul to the South. The retail trade of the city has had few failures during the prolonged trade depression.

The value of the exports of the State and city of Sao Paulo in 1912 was 530,135,091 milreis, and the imports, 348,698,304 milreis. This is considered one of the wealthiest of the Brazilian States. Its exports consist almost entirely of coffee, and the trade conditions depend on the demand for this product. At present, owing to exports of coffee being restricted by the European war, the prices are low. Consequently the trade of the whole State has been depressed. During 1914, however, the percentage of failures among the importing houses was not high. Commerce has been experiencing a readjustment for the last 18 months, and while the general trade movement is slow, it is now showing a little more strength. The commercial center of the State of Paraná is Curityba. The 1912 exports of this region were valued at 28,452,421 milreis, and the imports at 19,476, 511 milreis. This State's production is generally agricultural, and the basis for its wealth is "herve matte" tea, which is exported principally to Argentina. There has been a decrease in the demand and a fall in price, which has affected trade, but it is said that some improvement is now being noted and is expected to continue. The imports of merchandise are said to have been largely from Germany. Foreign buying is low at present, but the consumption of native goods is stated to be not much below normal. Stocks in the most demanded lines are kept well filled, but there is a decrease in the supplies of luxuries and little disposition is shown as yet to restock. Collections are not regarded as very unfavorable, and sales are reported as being made on 30 days credit for provisions and 90 days for dry goods, etc.

The State of Santa Catharina, of which Florianapolis is the chief city, has a general agricultural population and is not dependent on any one line for its prosperity. Its exports in 1912 were valued at 3,325,755 milreis, and its imports at 7,242,759 milreis. Lard is the principal product for export and domestic consumption. Then come butter, herve matte tea, lumber, manioca flour, rice, beans, hides, etc. Prices for the most part at present are fair, it is stated, but on some of the items of largest production the current quotations are low. Trade is reported to be quiet and importations small, yet stocks are kept sufficient for the demand. Collections are reported slow.

The foreign exports of the State of Rio Grande do Sul—Porto Alegre is the principal commercial center—in 1912 amounted to 21,925,516 milreis, and the imports to 75,314,573 milreis. This wealthy agricultural State ships its various products to other parts of Brazil. It is not directly affected by the coffee and rubber markets, and therefore has suffered less trade depression than the other States. The demand at present is said to be good, although less than in the prosperous year of 1912. External influences have reduced importation, but stocks are said to be fair and sufficient for the demand, with the exception of provisions which are reported as low owing to the unusual demand from outside which has caused the Government to stop exportations to Uruguay and Argentina for the present. Collections in the interior are said to be fair, but have been retarded by the moratorium which applied to the whole country up to December 15. Dealers in provisions are said to be doing well, but the trade movement is reduced among the textile, dry goods, hardware, drug and other lines. A fair proportion of the goods used in this region has been imported from Germany. There have been few failures among the importers, and the retail trade is reported healthy. Rio de Janeiro houses consider trade good with this part of the country.

The State of Matto Grosso's chief commercial center is the city of Corumba. The foreign exports of this section in 1912 were valued at 3,606,763 milreis, and the imports at 8,685,383 milreis. This trade region is situated on the western boundary of Brazil and produces rubber, hides, dried meat, etc. The market for rubber has been dull, but satisfactory prices have been realized for other products. This section is said to be much affected by the decrease of facilities for export and import owing to the European war, and the trade movement has been much reduced in consequence. Stocks, however, are said to be ample for present trade requirements, but they will become depleted unless facilities for importation are bettered. Rio de Janeiro houses report collections satisfactory.

GUIDE BOOKS TO JAPAN AND CHINA

THE prices per volume of the Eastern Asia Official Guide Books were unavoidably omitted from the notice that appeared in the April number of THE INTERNATIONAL REVIEW. They are:

Vol. I.	Manchuria and Chosen	7 yen
Vol. II.	Southwestern Japan	5 yen
Vol. III.	Northeastern Japan	5 yen

Volume IV is in course of printing and is expected to be sold at 7 yen. (A yen equals about 50 cents, United States currency.) These books are prepared by the traffic department of the Imperial Government Railways of Japan, Tokio, and are for sale by them and by the Japan Tourist Bureau, and by Kelly & Walsh, Ltd., at Yokohama, Shanghai, Singapore and Hong Kong.

THE SPELL OF FLANDERS *

THE vacation tour of which this attractive volume is the result closed during July of last summer. But the catastrophal events which have happened since then, in the territory described, have colored the writer's treatment of his subject, as is only natural, and have also guaranteed to the book an interest on the part of the reading public which, however much it may deserve that interest of itself—and it assuredly does—it might not otherwise have had. There is a class of readers who enjoy participating in other people's journeys when circumstances forbid the direct enjoyment of traveling oneself—it is always the true traveler who enjoys books of travel — books about things and places. But of that larger class of readers who cannot be made to see what great pleasure can be had from such books, there are many who will now want to read this book and to know something more of towns like Ypres, Dixmude, Malines, long forgotten by the tourist, in spite of their rich store of art treasures and historical memories. Now that shot and shell have battered them anew, and the peaceful fields about them are drenched with blood as so many times before, there is an undoubted fascination, even for the non-traveler, in following this quartette of leisurely cultivated travelers in their summer in Belgium.

A picturesque glimpse of Bruges, from "The Spell of Flanders," by Edward Neville Vose

It is indeed with a certain bitterness that Mr. Vose repeats again and again his statement that now many tourists will make the pilgrimage to Ypres and Malines—just to name two out of many old towns, and will stare about them, revelling in gruesome memories of the immediate past, where for years charms such as few corners of the world can show have failed to attract them. It is saddening, this suggestion, because of its undoubted truth. But it has one comfort. The tourist's dollars will help rebuild the industries of Belgium, and will, as often before, put that storm-racked little country on its feet again. Belgium, for the Flanders this book treats of is the oldest and most interesting part of Belgium, the most characteristic Belgium in every way—has always occupied a unique position in Europe, in the world, in fact. No other stretch of territory of the same dimensions can show such a concentrated sum of highly developed industrial life, developed under such difficulties, or such a notable standard of art achievement, in painting at least, as can this tiny country. And no other country of equal size has had such a stormy history. Invasions, changes of royal masters, wars without end, devastations, unceasing—these have been the portion of Belgium always. Mr. Vose's attitude of refraining from comment on present conditions is laudable in the extreme, and adds much to one's pleasure in reading his book.

The pictures of such delightful ancient towns as Tournai, Ypres, Ghent, Bruges, Malines, and many others are penned with a vividness of memory which imparts to the reader the writer's keen enjoyment in his visits to these places. There are short bits of history re-narrated to us as we stand with the writer on the spot where these events occurred. And there is much that is valuable for future reference told us regarding the past and the present of Belgium's many industries. Many amusing little scraps of personal adventure lend an intimate touch to the book, but the sense of proportion is never lost.

There are many charmingly written passages one would like to quote in snatches if space permitted. But in lieu of this the reader of non-fiction can safely be advised to take up this book with pleasurable anticipation. He will not be disappointed. Its kind is a good one, and it is an excellent example of its kind.—*From a review by J. Marchand in the Publishers' Weekly of April 17th.*

* THE SPELL OF FLANDERS, by Edward Neville Vose, Editor of DUN'S INTERNATIONAL REVIEW. Published by The Page Company, 53 Beacon Street, Boston, Mass., U. S. A. Price, $2.50 net.

HISTORY OF SPANISH RULE IN SOUTH AMERICA

THE era of Spanish rule in South America is one of the most interesting periods of history. It began with voyages of discovery, exploring expeditions and conquests that for audacious courage and inflexible purpose equalled and often surpassed the legendary tales of the ancient world. This period lasted some sixty years—from 1492 to about 1550—and covered more than two generations of adventure in regions the extent of whose perils and physical boundaries were alike unknown.

Then came the second period, which lasted nearly two centuries —from 1550 to 1730. This was marked by the organizations of local governments and their development by the viceroys and their subordinates in order to hold the incalculably rich possessions that had been so intrepidly won. The third act of this vast drama began in 1730 and reached its climax and conclusion in the battle that was fought at Ayacucho, a small town of Peru, December 9, 1824. The victory that was won there definitely broke the power of Spain in South America.

A recently published work,* which is not only authoritative but interesting, deals with the middle period, that of the political and social evolution of the southern continent, and traces the organization and development of the Spanish dependencies. Its author, Bernard Moses, is a professor in the University of California and honorary professor in the University of Chile. He has brought to bear on his task not only a wealth of learning and profundity of research, but also an unusual understanding of the spirit of the people of whom he writes.

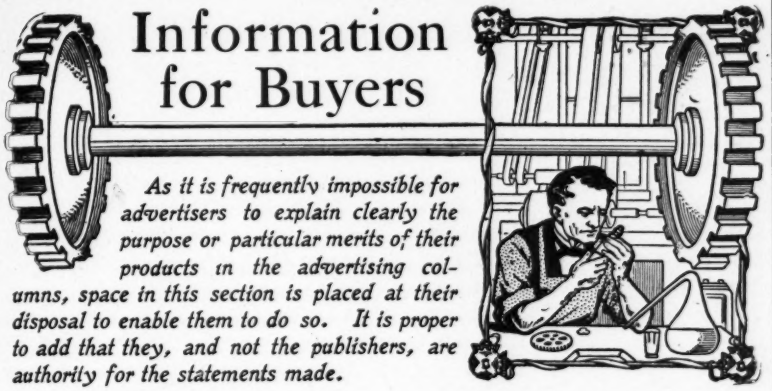
While Prof. Moses' work aims to present an account of the nearly two centuries in which the rule of Spain strove to be practically absolute, he also treats of the beginnings of European civilization in widely separated regions of South America, and sets forth some of the characteristic events associated with the slow development of colonial communities. He brings into view, also, in so far as they led to the establishment of European settlements, the early voyages of discovery and the exploring expeditions that give a certain romantic quality to the history of the first period.

His work ends with the early part of the eighteenth century, which witnessed a change in the ideas and aspirations of the colonists, when the rapidly increasing class of those who felt that they owed their allegiance to the country of their birth or adoption rather than to Spain, aroused by the obstacles placed by the home government in the way of progress and by exclusion from important offices, began to inquire how they might cast off the bonds that retarded their progress and choked their independence.

The history of the development of public opinion in various parts of South America, and the series of events by which this resulted in the formation of independent states, usually has been regarded by writers as less attractive than the age of adventure that preceded it or the dramatic unity of the third period that followed. Prof. Moses, however, has succeeded in making interesting what has been hitherto a relatively dry narrative of political unrest and evolution.

Starting with the early voyages of the Spaniards to the American continent, he traces the history of that part of the world through a long succession of events and changing circumstances, deals with various expeditions, the founding of missions, and the exploration and settlement of the different parts of the interior, the foundation of Lima, the conquest of Chile, the beginnings of Tucuman and the Jesuit missions in Paraguay. Many chapters are devoted to various phases of life in the different cities, and the organization of government and society generally in the different departments. For example, the chapter concerning the discovery of the mines of Potosi, and the wealth and extravagance resulting therefrom, is particularly interesting. It gives the reader a vivid account of life in a mining town in Upper Peru, and graphically describes the gorgeous display of wealth indulged in by the inhabitants. Altogether the volumes are full of interest for those desiring to study the Spanish dependencies in South America 300 years ago.

* THE SPANISH DEPENDENCIES IN SOUTH AMERICA, by Bernard Moses, Ph.D., LL.D., Professor in the University of California, Honorary Professor in the University of Chile. Harper & Bros., New York. 2 Vols. Price, $5.00 net.



Information for Buyers

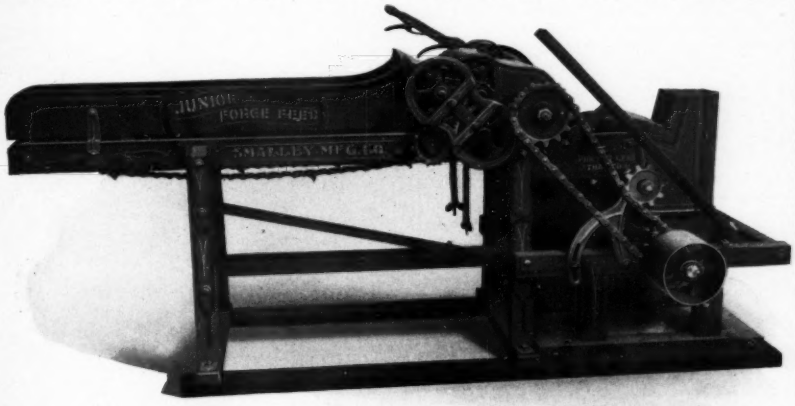
As it is frequently impossible for advertisers to explain clearly the purpose or particular merits of their products in the advertising columns, space in this section is placed at their disposal to enable them to do so. It is proper to add that they, and not the publishers, are authority for the statements made.

A New Recutting Alfalfa Meal Machine

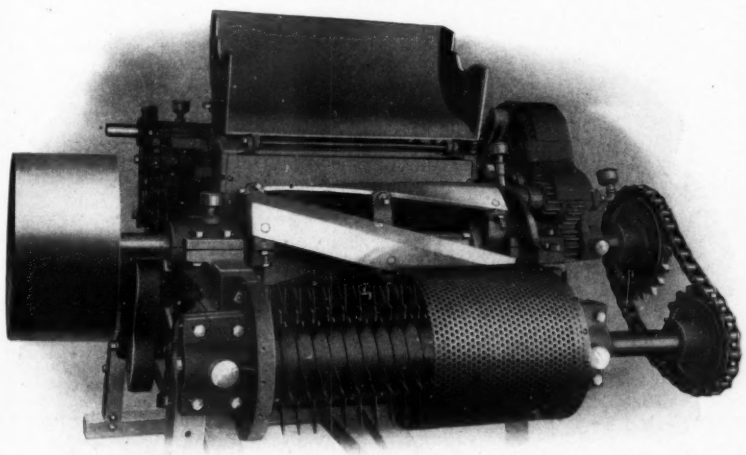
THE Smalley Recutting Alfalfa Meal Machine, is a new device designed for attachment to other cutters made by the same company. It is said to be meeting with great approval among farmers and stock-raisers because of the notable saving in cost of feeding made possible by its use. With one of these machines the farmer who raises alfalfa to feed his cattle, sheep, hogs or poultry. can sell his best quality hay and reduce that of inferior grade to meal, the feeding value of which is rendered greater because of the relish with which it is consumed by the animals after it has been properly cut. Dried bean straw, rice straw and pea vines can also be turned into meal in the same way.

This machine can be easily attached to any Smalley cutter of the sizes 12 to 40. It is very rapid in action. With a No. 16 cutter, 95 pounds of meal can be produced in two minutes. The recutter takes the vines or hay directly after they have passed through the first cutter, and by a series of shredder knives transforms them into a fine meal which is forced through a screen as fast as it is made.

The Smalley cutters, with which these meal machines are designed to be employed, are made in a wide variety of sizes, and have obtained an excellent reputation for reliability, rapidity and good work when cutting feed for filling silos wherever they are used. The regular equipment of these machines comprises cuts of ⅛, ¼ and ⅜ inches, but a special device can be supplied at a slight additional cost which will allow of a ½ and ¾ inch cut. They are all built interchangeable for blower or carrier, and the same engine that runs the cutter will provide power for whichever one may be used, as well as for the meal making attachment. Catalogues, prices and other information pertaining to the above machines can be obtained by addressing the Smalley Manufacturing Company, Department D, Manitowoc, Wis., U. S. A.



The Junior force feed cutter, with chain drive blower and a 4 or 6 h. p. gasoline engine, fills silos quickly

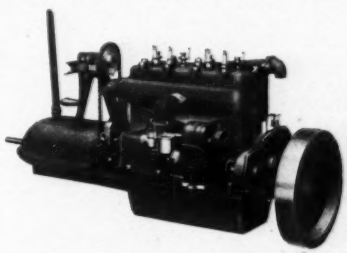


Sectional view (with screen cut away) of the Smalley recutting alfalfa meal machine that decreases grazing costs

A Marine Motor for Craft 14 to 24 Feet Long

THE Universal marine motor is built by the Universal Motor Company, of Oshkosh, Wis., U. S. A., in one size only. This is a four-cylinder, four-cycle en bloc model, bore 2½", stroke 3½", capable of running up to 2,000 r.p.m. Some features of this motor which will be appreciated are the use of die-cast bearings and a special steel crankshaft accurately ground. Crank pins are 1¼" diameter, 1½" long. The two crank bearings are 1¼ by 2½", and the motor can be supplied with either a front or rear starting crank. Some of the high-grade specifications of this motor include one-piece hardened cam-shaft, mushroom valve tappets, hardened drop-forged connecting rods, oil pump self-contained in the crank-case, 1-inch valves with cast-iron alloy heads, etc. All parts of the Universal motor are interchangeable and the complete weight is 250 pounds.

The idea of the manufacturers of the Universal motor is to fill the requirements of the great number of motorboat owners, whose craft measure from 14 to 24 feet in length; to offer a unit power plant as nearly universally suited for small boats as possible and to specialize upon its details so that the best possible machine can be offered at a price within the reach of all. The motor is rated at 6 to 10 h.p., which is delivered between 800 and 1,500 r.p.m. At its top speed of somewhere near 2,000 r.p.m., it will deliver as high as 10 to 12 h.p. A kerosene attachment is supplied at slight extra cost.



A motor for boats 14 to 24 feet long

An exceedingly interesting and well illustrated catalogue has been issued and a copy will be sent upon request to any reader of the INTERNATIONAL REVIEW.

"Fabrikoid," a Substitute for Leather

THE Du Pont Fabrikoid Company, Department 160, Wilmington, Delaware, U. S. A., have just issued an attractive and interesting booklet on Fabrikoid. Its cover, while of paper, is a striking reproduction of leather. It shows five different colors and grains of Fabrikoid.

The booklet is well printed and illustrated and no doubt will be in demand. It will be sent postpaid to any address.

An Improved Rowboat Motor

SPECIAL attention is called here to the improvements embodied in the 1915 line of Evinrude motors which is about to be put on the market, an advertisement of which will be found in this number. Evinrude motors, on account of the universal satisfaction they give, have always been very popular, both with those who use them only for pleasure, and with those to whom a reliable boat motor is a necessity in their daily work, such as lightermen, fishermen, etc. The 1915 line of Evinrude motors, in addition to the built-in flywheel magneto and the famous Maxim Silencer as regular equipment, will be fitted with an instantaneous reversing device which permits of running the motor from full speed ahead

The 1915 Evinrude motor adds much to the pleasure of boating

to full speed astern by a simple twist of the tiller handle. This feature adds very considerably to the value of the motor, by making it more flexible and safer when navigating difficult passages, manoeuvering to get through between other craft—of special value in a crowded harbor—in landing on the shore or at a dock, avoiding collisions or in reaching a positive location.

In addition to the above improvements there have been a number of minor changes all of which tend to still further enhance the value of the Evinrude.

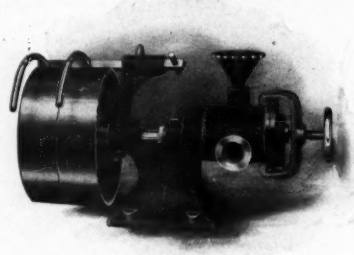
Another item of general interest is that the Evinrude line has been considerably extended by adding some new models. There are now 12 models to choose from. These motors, which can be clamped instantly on to any solid support, are also widely used on land for running churns, washing machines and cream separators; for sawing wood, grinding feed and furnishing the power for all kinds of light machinery. Those interested will find it profitable to communicate with the exclusive foreign distributors, Messrs, Melchior, Armstrong & Dessau, 114 Broad Street., New York City, U. S. A., who will be glad to supply a catalogue or further information upon request.

Up-to-Date Dairy Appliances

THE strictness with which the health authorities guard the milk supply of all communities, the value of a reputation for quality and the necessity of avoiding all manner of waste in these days of close competition have practically compelled the enterprising dairyman to give the closest attention to the various devices that are capable of improving the sanitary quality of his product. One of the most important processes is the proper cooling of the milk as soon as possible after it is taken from the cow, as upon this depends to a very great extent its keeping qualities. In the old days when individual production was small, this requirement could be met in a more or less satisfactory way in warm weather by placing the pans in a spring or running water, but to-day, when dairy operations are on a more extensive scale, methods have had to be devised by which this work can be done more economically and with a greater degree of certainty as to results.

An economy foot-power, two-compartment bottle washing outfit for small creameries

Among the most efficient devices that have yet been presented for this purpose is what is termed by the manufacturers a "water way tubular copper cooler." This cooler consists of a series of copper tubes, one above the other, placed in a rack over a tank. Water of the desired temperature is admitted into the top tube and runs slowly through the others to an outlet in the lowest. Above these tubes there is another tank into which the milk is poured. It



A sanitary milk pump that is simple in construction and easily cleaned

passes through a perforated bottom and flows slowly down over the pipes into the receptacle below.

Another convenience that saves a great amount of time and labor is a low-priced but very practical and efficient steel frame bottle filler. With one of these machines from four to six times more bottles can be filled than is possible by hand, the bottles are exactly filled and there is little or no waste, which is an additional advantage. All the steel parts of these fillers are heavily coated with pure tin, while the filling parts are made of brass and nickel-plated. These machines, as well as the cooler above mentioned, are easily cleaned. They are conveniences that will assist materially in the work of any dairy.

The Creamery Supply Manufacturing Company, Clinton, Wisconsin, U.S.A., have ready for distribution a catalogue in which these devices and a full line of modern dairy equipment are illustrated and described. Anyone interested in this class of apparatus can obtain a copy by addressing the manufacturers as above.

New Direct Current Motors

THE new type "C" direct current motor just announced by The Robbins & Myers Company, Springfield, Ohio, is at present made in sizes from ⅛ to 3-horsepower inclusive.

The frame is cast iron and is low and compact, adapting the motor for installation

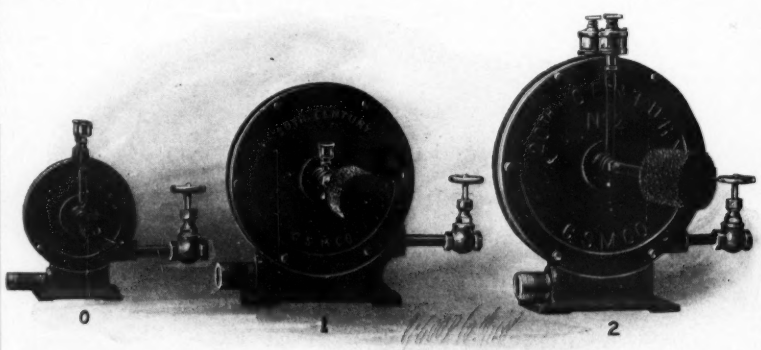
These Type "C" motors range from 1/8 to 3 h. p.—the latter is here shown

where the space is restricted. The bearing bracket on the commutator end extends well out from the frame and gives easy access to the commutator and brushes. The bearings are oil ring lubricated and equipped with overflow and drain plugs.

These motors can be furnished open or fully enclosed; horizontal or vertical; for continuous or intermittent service; constant or variable speed; short, series or compound wound. They are made for 115, 230 and 550 volt circuits, also for service on low voltage storage battery circuits.

Each motor is regularly furnished with sliding base, no-voltage release starter and cast iron crown pulley. They can also be furnished with idler pulley or back gear attachments if desired.

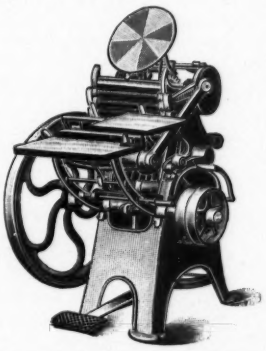
Full particulars regarding this or other types of motors made by this concern may be had by addressing the company as above.



These improved steam-power "20 Century" turbine milk bottle washers are low in price, but high in efficiency. Made in three sizes, the smallest for cream testing stations, the largest for large creameries

Printing at Moderate Cost

EVERY business house, large or small, has more or less use for some kind of printed matter, and to a very great extent the success of the concern depends upon the liberality with which it is employed. Every merchant realizes the necessity of drawing the attention of the public to what he has to sell, and while the preliminary advertising is done through newspapers and magazines, it must be supplemented by circulars, catalogues, etc., in which more complete descriptions can be given. In addition to this every mercantile enterprise must have cards, letterheads, billheads, statements, forms, etc., which if used in large quantities cost considerable money.



An easy-running printing press, operated by foot or belt power

Printing is expensive, no doubt, but the cost can be much reduced by the merchant investing in a small plant, with which he or one of his employees can do the work. So generally is this fact becoming appreciated, and so great an aid has a plentiful supply of printed matter proved to be in building up a business, that the number of concerns doing their own printing is steadily increasing. This applies to every kind of enterprise, from the smallest to the largest, and is due, not alone to the money that can be saved, but also to their being able to have the work done in the way and at the time it is wanted.

The installation of a printing plant was formerly a matter of considerable outlay, and was hardly warranted except for a professional printer or for a concern using an unusually large amount of printed matter, but to-day for a very small expenditure a remarkably complete little outfit can be obtained capable of doing a large amount of very satisfactory work. The smallest of these outfits can be bought for less than $10, including a press 3x5 inches in size, type, etc., and can be used for cards, labels, envelopes, etc. Its scope, of course, is limited and it is only suitable for those having a small amount of work. However, as much more as may be desired can be paid and any requirements be met. As an example an outfit costing $100 is recommended as a very complete jobbing plant, and one with which a great variety of printing, such as is required by an ordinary business house, can be done. It includes a self-inking rotary job press 7x11 inches; furniture and quoins; black and colored inks; ten fonts of type; type cases and cabinet; leads, bodkin and tweezers; guage pins, mallet, planer and can of oil; composing stick; can of cleaning preparation; lead cutting machine; rules, dashes, etc. Anyone, with a little experience, can do as good work with one of these plants as a professional printer, and many purchasers are making good profits by doing printing for others.

A large catalogue containing a full description of these printing outfits, as well as all kinds of printing supplies and much valuable miscellaneous information, can be obtained by writing to D. Kelsey & Co., Meriden, Conn., U. S. A.

A New Household Convenience

DOING the household ironing in the old way is a tiresome task. The heat and the physical exertion of changing the irons every few minutes add vastly to the sum of the day's fatigue. Much of this, however, may now be avoided by using a self-heating flatiron which, it is claimed, saves fully one-half the time and two-thirds of the effort. Moreover, the ironing can be done wherever most convenient—on the porch, under the shade of a tree, or where the coolest spot can be found—an almost inestimable advantage in warm weather.

This new iron uses gasoline for fuel. It is heated from the inside and is ready for use in two minutes after the burner is lighted. The heat is maintained no matter what kind of work is being done, and can be increased or decreased at will by merely turning a valve wheel. As no flame ever touches the surface of this self-heating iron, its high polish is preserved indefinitely, so that there is never any sticking, regardless of what kind of starch may be used or how the starching is done. This enables it to do much better work on delicate fabrics and laces, as well as on fine table linens, underclothing, etc., than is possible with the old style iron.

A self-heating flatiron that does away with more than half the drudgery of ironing day

The self-heating flat iron is distinguished for its simplicity, durability, efficiency and economy. It is made of the very best materials and is mechanically perfect. There is nothing to get out of order. The cost of operation is remarkably low, because this iron consumes seven parts of air to only three parts of gasoline. The iron is very attractive in appearance, being finished in triple nickel plate and highly polished. It weighs only 5½ pounds and is extremely easy to handle. In fact, many people who like to do a small amount of personal work for themselves, such as pressing clothes, handkerchiefs, underclothes, etc., when they are away from home carry one of these irons in their trunks, finding them not only economical, but convenient.

The American Gas Machine Company, 86 Warren St., New York City, U. S. A., who are the manufacturers of the American Self Heating Flat Iron tell all about it in a neat little catalogue which they will send to any address in the world upon request. They are also large manufacturers of all kinds of gasoline heating and lighting appliances. This self-heating flatiron, they state, is the fruit of 20 years experience in this line.

Accounting by Machinery

MACHINES, whether of peace or war, play a large part in the modern struggle for supremacy, and the office which backs up its brain power with mechanical helps is more efficient than the one which neglects such means. Machines have made commodities cheaper—it is now possible for a machine to make accountancy more efficient and less expensive.

If the counting-house is to move with the times and not become a profit-killing expense it must, like the factory, the laboratory, the mill and the mine, take full advantage of mechanical assistance. Modern machinery is the accumulated thought of the keenest men of the past and present. Is this service to be ignored? Will not the business concern which grasps it outstrip the competing firm that neglects it?

Machinery in the office is not a new thing—the typewriter is universal, and the adding machine is fast gaining in popularity. But why write with one machine and add with another—two operations? Why not go a good stride forward by writing in the details and automatically negotiating the calculation on the same machine?

The necessity for automatic calculations is becoming greater every day. To deal with the mass of figures attached to the conduct of business is, in these days of dissection and analysis, a big and expensive matter, and yet figures are the very essence of business. Figures show sales, record expenditure, represent stock, analyze and dissect returns (locating losses and declining sales) in fact, figures constitute the pulse of any business by which its health can be gauged.

The problem is to negotiate these masses of figures and the writing attached to them with the least expenditure of labor. It has been suggested above that the combination of writing and calculating on the same machine would be an important advance in the way of office equipment. Such a machine is now available in the combination of typewriter and adding machine known as "The Yost Mechanical Accountant." This machine writes, adds and subtracts. It deals with accounts or statistics as easily and completely as an ordinary typewriter deals with correspondence—it entails no mental effort and no human fallibility enters into the calculations. The act of typewriting does the calculating, and an absolutely correct answer is registered on a dial.

The speed of production is expert type-

writing speed, the placing of the figures in the proper columns being automatic. The details and figures are written with the distinctness and regularity always associated with the work of the ordinary "Yost" typewriter. Quantities, weights, measures, time and money can be calculated on the same machine, at the same time. The number of columns is limited only by the width of the paper, and they can be distributed over the page as desired. Among the infinite varieties of work which can be done on this machine, apart from the most obvious use of simultaneous invoicing and day-book entering, may be mentioned balance sheets, specifications, dividend payment lists, indentures, wage sheets and freight accounts.

It is impossible in this short article to give any idea of the application of this machine, but experience has proved it to be of value in nearly every business and many professions, while it is not without value in the realm of science. The adding and subtracting mechanism is simplicity itself, and can be mastered by an efficient operator in a few minutes. The machine is error-proof, and there is nothing to get out of order.

The present day need is for efficiency, and this quality in the field of accountancy and routine means the cutting out of every ill-directed mental effort. and every unnecessary stroke of the pen. The "Yost Mechanical Accountant" accomplishes this by eliminating

This "Mechanical Accountant" saves labor and eliminates inaccuracy

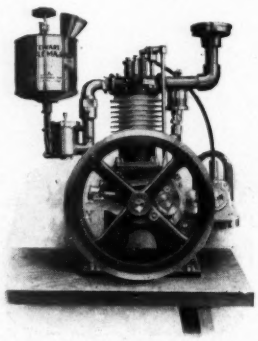
the necessity for slow pen-pushing and duplicating in writing and mental effort and risk of error in calculation. In hundreds of ways machinery has aided man and lessened his labor, mostly in relation to muscle and brawn. Now the same aid is applied to the mental sphere in a manner which is bound to effect far-reaching economies. To save labor is the constant aim of the business organizer. The "Yost Mechanical Accountant" not only saves labor, but saves the highly-paid time of the brain-worker. It is a fair venture to prophesy that in the comparatively near future no calculations will be made by the human brain, or if they are made they will certainly be checked by machinery; and when this has become general it will be found that the "Yost Mechanical Accountant" can be credited with no small share in bringing about this revolution.

Aided by the "Yost Mechanical Accountant" the clerk of the near future will be able to accomplish vastly more than he can to-day, and will have time to turn his brain from the monotony of totalling endless columns of figures to the exercise of initiative and any creative ability he may possess. Equipped with this product of an inventive age the counting house of the immediate future will be conducted on the most economical lines and at a minimum of expense will be able to provide analyses, dissections and other information of value to the executive with an efficiency and comprehensiveness never attempted in the past.

Full particulars regarding this machine may be obtained by applying to The Yost Typewriter Co., Ltd., 50 Holborn Viaduct, London, England.

A Remarkable Little Gasoline Engine

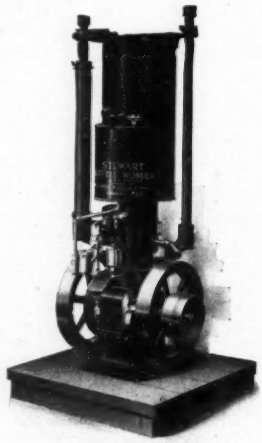
A GREAT many persons who could make profitable use of a gasoline engine developing from one-half to three horsepower, go to the expense of purchasing engines much larger than their requirements call for, because of the impression they have that small motors are not always reliable. This belief, wherever it prevails, is probably a survival of the early days of the gasoline motor, when some hurriedly constructed engines of dubious merit were thrown on the market. Nothing like these conditions, however, exists at the present time, for no matter what



"Little Major" gasoline engines are among the sturdiest small motors made

its size, it is safe to say that any engine—small or large—now offered for sale by a reliable maker will do whatever is claimed for it.

An excellent example of the truth of this statement is provided by a little one-half horsepower motor that is to-day giving splendid service on thousands of farms and in shops and factories, in many cases doing work formerly done by larger and more expensive engines. It runs washing machines, cream separators, shears sheep and clips horses, pumps water, saws wood and grinds feed. It supplies the power for small lathes, grindstones, drilling machines and other light machinery. In fact, a great many owners of large motors are purchasing these small



This 2 h. p. "Little Wonder" water-cooled engine is convenient

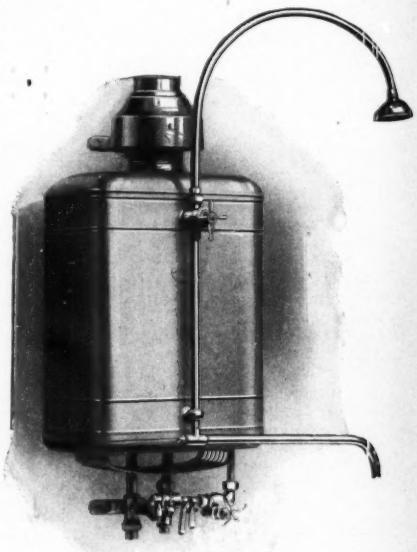
ones, because their cost of operation is so low and they are so inexpensive, that they are cheaper to use than the bigger engines when only a small amount of power is required.

The perfection of these small engines is, of course, due largely to the close attention given to their construction, the use of the best material and the elimination of all unnecessary parts. Except for their greater simplicity, they are built as carefully as a high grade watch. These little engines ordinarily use gasoline for fuel, but with a slight change can burn kerosene if preferred. Ignition is by means of a magneto, the same as in the most expensive automobile engines, which adds to the motor's simplicity by doing away with all batteries, spark coils, distributors, commutators, etc.

The Chicago Flexible Shaft Co., East Ohio St., Chicago, Ill., U. S. A., who are the makers of the Stewart Little Major Gasoline and Kerosene Engines, as the above mentioned motors are known, also manufacture Stewart's Little Wonder, a two-horsepower engine, and the Stewart 3½-horsepower motor, specifications and all information pertaining to which will be found in an illustrated catalogue that any person interested in a reliable little motor can obtain on request.

Plenty of Hot Water

THERE is no greater comfort and convenience in the home than a plentiful and constant supply of hot water, and this is promised to everyone who uses the Humphrey Instantaneous Shower Bath Water Heater. The accompanying illustration shows that it



This simple, convenient device furnishes a bathtub full of hot water for about two cents

is a compact device of simple and attractive design. It can be placed in a bathroom or wherever convenient, as it occupies little room, and it is always ready for use. It is only necessary to light the gas; the hot water presently pours out at the rate of two gallons per minute. The cost of the gas consumed to heat a tubful of water for a bath is only about two cents. The heater is made of copper, with valves of brass, all nickel-plated and highly polished. By an ingenious valve arrangement the water can be turned into the overhead spray, thus supplying a delightful shower bath.

It is possible to obtain water of any degree of temperature desired by increasing or decreasing the flow through the heater. Cold water can be drawn through it by turning on the water without turning on the gas. These heaters are claimed to be carefully made and are guaranteed against defects in either material or workmanship. They are carefully packed for overseas shipment, so that they will reach their destinations in perfect condition. Full information can be secured by addressing the Humphrey Company, 601 Rose Street, Kalamazoo, Mich., U. S. A.

Unusual Conditions under which Overlands have Worked in Belgium

IN the official news from Europe little mention is made of the small remnant of the Belgian army which fought so gallantly in the early stages of the war. But a letter just received by the Willys-Overland Company, Toledo, Ohio, from the chief mechanic in charge of the big squad of 300 Overlands purchased by Belgium shortly after the outbreak of hostilities proves that the small army is still a factor in the northern fighting.

An interesting description is given of one of many trips from Calais to the fighting front the cars are called upon to make. The letter gives an inkling of the terrific conditions under which the Overlands are forced to work continuously:

"I was ordered to drive the director of the cannon factory and an officer from Calais to the front," runs the letter. "In addition to the passengers the car, which has a transport body like that of other Overlands in use here, was loaded with artillery parts for repairing guns, together with a quantity of petrol and oil necessary to last us the entire drive. The weather was cold and foggy, with a strong wind blowing off the sea.

"Before leaving Calais we were stopped by the first of the many sentries encountered everywhere. They spring up suddenly, apparently out of the ground, like jacks in the box. We were stopped three times before arriving at Dunkirk, and each time we were forced to show our papers and passes.

One of 300 Overlands for the Belgian Army being unloaded at Antwerp last September

"In the towns we were only allowed to maintain a speed little faster than a walk, but on the open road there is no limit. The Overland often reached a speed of fifty miles an hour with its full load.

"After we left Dunkirk the hard driving started. Upon leaving the town we turned sharp to the right and followed the canal for a long distance, passing a number of cars smashed and deserted at the roadside. We saw an Overland upside down in the canal It had evidently been deliberately driven into the canal to prevent capture at some time.

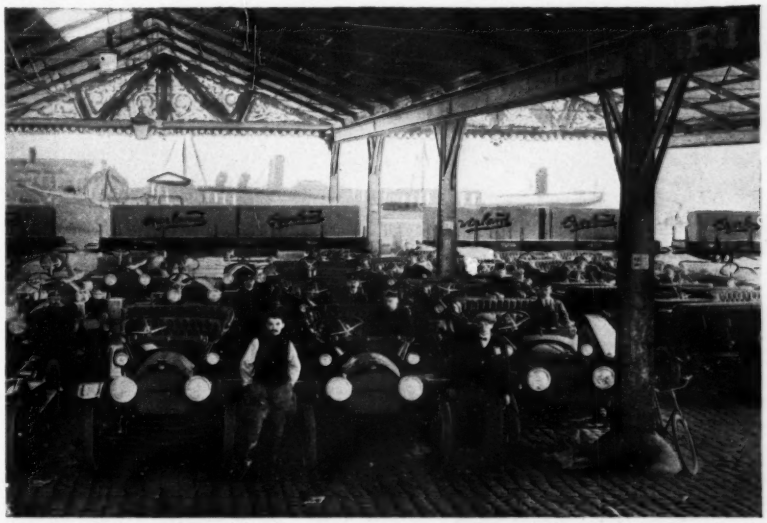
"When we left the canal banks the roads became exceedingly rough and were fearfully cut up by the passing of heavy transports, the troops and artillery. While rounding a turn at fair speed I had to jam on the brakes to keep from running into some nasty looking barb wire entanglements which stretched across the road about two feet high. Upon alighting I found that there was just enough room left for our car to crawl through diagonally across the road.

"We had just gotten up speed again when we were forced to stop and squeeze past some earthworks built on either side of the road, allowing just room enough to get the car through with a great deal of manipulation and close work. Immediately after that we encountered a series of trenches dug almost clear across the road. A fall into these big ditches would probably put the car out of commission and seriously injure the passengers.

"Sleet and snow, which came at this point would have made driving very difficult and dangerous had it not been for the excellent adjustable windshield with which the Overland is equipped. When we arrived at Houthem, once a prosperous Belgian city, we found it occupied entirely by the military, practically all of the inhabitants having left. The streets were alive with soldiers, horses and guns, going to and from the fighting front, or changing positions. In the distance we could hear the continuous booming of the Belgian 150-millimeter guns. In the city we lunched on sandwiches and lumps of chocolate and were on our way again in less than a quarter of an hour.

"The only road from here to the front was of the roughest sort, hurriedly constructed for army use. In some instances the ruts were fully a foot deep. The Overland sped over fields, bumped over railroad crossings, floundered in mud up to the axles, and I drove half the time with the front wheels caught in the great ruts made by the heavy guns.

"We finally reached our destination, where noise of the guns was deafening. This with the clack of the mitrailleuse, the shrieking of shells and the continuous galloping of batteries made bedlam of what used to be a peaceable farming country. I unloaded the car as soon as possible and started the return journey in the dark. And driving at night in Belgium is far different from the night driving you know. Our work requires full speed, but we are allowed only half of our lights, and even they must be dimmed.



How some of the Overlands looked before the military authorities of Belgium began the work of changing the bodies to adapt them to the requirements of army use

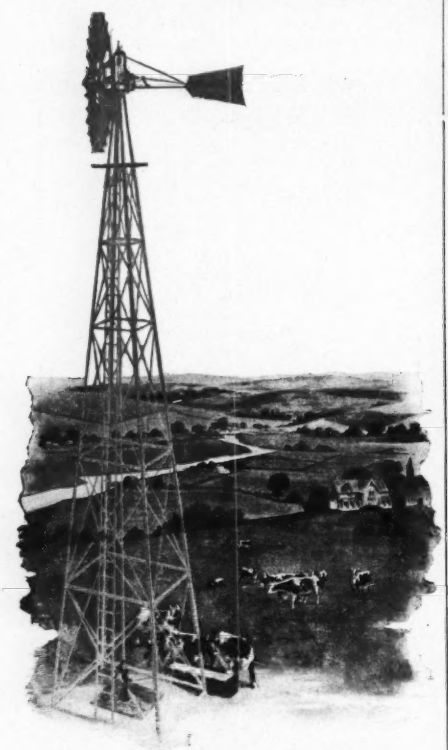
"If you could but know the rough treatment these Overlands have been having over here you would realize more than ever their ability to stand far more than any of the strains of ordinary usage. It is regular practice here to drive in a manner which would not be countenanced in the United States. We get to our destination as quickly as possible, without any thought of the car. If the car is disabled we leave it and take another. We have neither the time nor facilities for making repairs.

"The fact that I have driven the same Overland under these extreme conditions since its arrival in Belgium last September seems to me the best possible evidence of the wonderful stamina of the car."

A fleet of Overlands for the Belgian Army on the docks at Antwerp. Some of these cars still survive after having worked continuously through eight months of war

The Wind as a Source of Power

UNDER favorable conditions the most economical power for many purposes, both by reason of the low cost of installation and the absence of expense when in operation, is from the windmill. The great



The modern windmill is a marvel of strength, economy and utility

objection to the more general use of these machines has been that quite a brisk breeze was necessary for them to do efficient work, but so many improvements have been made in their construction within recent years that the windmill of to-day can be kept in motion by the merest zephyr. The principal factor that has made this possible is the almost entire elimination of friction. This has been accomplished by the use of ball bearings and anti-friction metal and by back gearing the mechanism. The latter means that the wind wheel makes two and one-half revolutions while the rod through which the power is transmitted makes one stroke each way. Thus the machine operates on the principle of a lever, and as the slightest movement of the air will keep the wheel turning it follows that there are but few days in the year when there will not be sufficient wind for the mill to work.

The improved all-steel windmills manufactured by The S. Freeman & Sons Manufacturing Company, of Racine, Wis., U. S. A., provide an excellent example of the perfection of these devices. The windmills made by this concern range in size from 6 to 16 feet in diameter, so that practically every requirement in this line can be supplied. They are absolutely self-regulating and adjust themselves to any pressure of wind, the only attention needed being an occasional oiling of the bearings. The power generated by these mills, of course varies according to the velocity of the wind, but the company state that in a wind blowing from 10 to 40 miles per hour their 12-foot size will develop from 1 to 4 horsepower, with the average about 2½ horsepower.

The Freeman Company has prepared an unusually complete catalogue illustrating and describing the superior features of their windmills as well as giving much valuable information for owners or prospective purchasers. Also included are descriptions of an extensive assortment of pump jacks, hand clover cutters, blower elevators for filling silos, cider mills, fanning mills, feed grinders, steel towers and other farm specialties. A copy of this catalogue can be obtained by writing to the company at the above address.

The Stump Puller Makes Waste Land Valuable

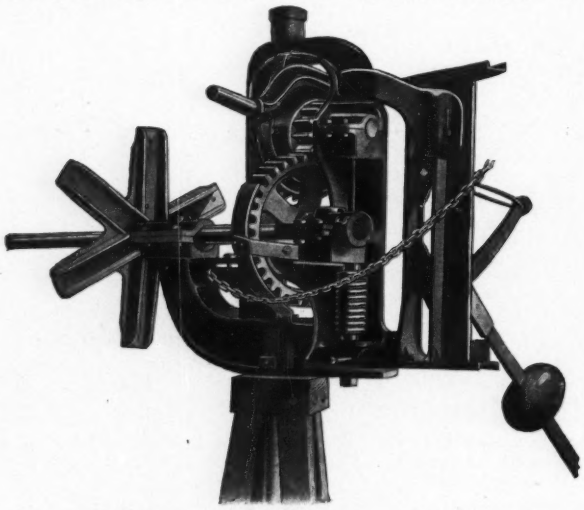
ALL over the world there are great tracts of rich land, where forests once stood, that are lying idle. The cutting of the timber has left the ground covered with stumps. Digging out the roots of these dead trees is impracticable because of the expense, and it takes years for most kinds of stumps to decay so they can be levelled and cease to be an obstacle to agriculture. Under such conditions the land quickly becomes overgrown with brush and small trees. It is entirely unproductive for twenty or thirty years until it is again covered with merchantable timber.

The introduction of the modern mechanical stump puller, however, has greatly simplified the problem of eliminating stumps or trees from "cut-over" land. One of these machines is capable of pulling out by the roots almost any sized stump in a few minutes, without any particular exertion on the part of the operator. The improved stump puller consists in its entirety of an ingeniously devised system of double or triple power steel pulleys, a powerful windlass of special design and a steel rope of extremely high tensile strength. This rope runs from the windlass (which is anchored in the center of the tract that is to be cleared) through the pulleys and is attached to the stump that is to be taken out. The power is supplied by a team of horses harnessed to the end of a long lever on the windlass, and the pull thus exerted is almost irresistible. The machine is wonderfully simple in action and takes out the stumps with marvelous ease and rapidity.

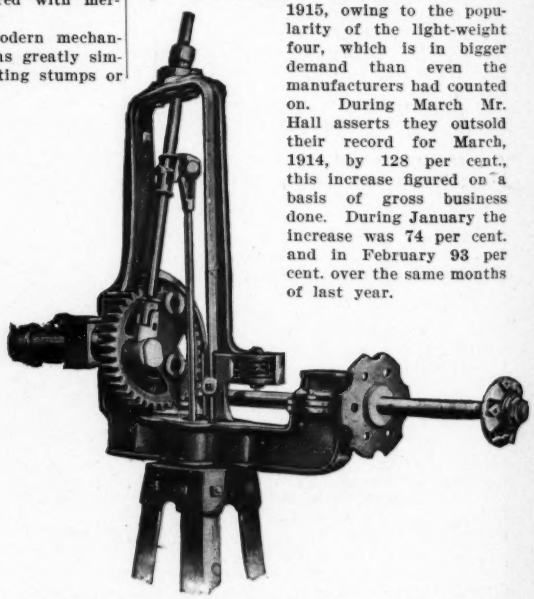
The strain is great, but the machine's durability is assured by the excellence of the materials used in its construction. The "Mighty Monarch" stump puller is guaranteed by the manufacturers to stand the strain indicated in their catalogue. Any casting that breaks—flaw or no flaw—inside of a year from date of shipment is replaced free.

The manufacturers of the "Mighty Monarch" have just invented and perfected a new design of stump puller which has all the advantages of the machine that they have been making for years, and some very important labor-saving features, which enable the operators to clear stump and timber lands much faster and easier than heretofore has been possible.

Interested persons will find it to their advantage to write for a copy of a catalogue that is now being distributed by the Zimmerman Steel Company, Lone Tree, Iowa, U. S. A., manufacturers of these "Mighty Monarch" Stump Pullers. It will be sent to any address in the world, together with any additional information desired.



Each revolution of the windmill turns the vertical shaft five times



Back-geared windmills develop more power than direct stroke mills

Rapid Gain in Oldsmobile Sales

THE Oldsmobile Company is entering its seventeenth year in business and, unless signs fail, its best year. Sales continue to show the same healthy increase which has prevailed since the introduction of Model 42 on the market, with every indication that 1915 will be a year of unparalleled achievement, according to J. V. Hall, sales manager of the Olds Motor Works, Lansing, Michigan, U. S. A.

A remarkably large volume of trade has been experienced during the first three months of 1915, owing to the popularity of the light-weight four, which is in bigger demand than even the manufacturers had counted on. During March Mr. Hall asserts they outsold their record for March, 1914, by 128 per cent., this increase figured on a basis of gross business done. During January the increase was 74 per cent. and in February 93 per cent. over the same months of last year.

"I do not consider these figures as at all astonishing," says Mr. Hall, "in view of the fact that we are marketing a medium-priced car, for which there is a universal demand and which is manufactured by the oldest and longest experienced producers of automobiles in America."

Coal Mining and Handling Machinery

AMERICA leads all other countries in the development of machinery for the mining and transportation of coal. Not only has the electric mine locomotive served its own special branch of usefulness, but incidentally it has solved, in the main, the whole problem of electric transportation.

For more than 30 years the Jeffrey Manufacturing Company have designed and built complete mine locomotives as one of their principal lines. The great variety of equipments which have been designed to suit various conditions has made it possible to incorporate in them the best ideas that have been advanced, and the highest development in the matter of standardized designs has been achieved.

The motor equipment is the most important element in the makeup of a successful mine locomotive. In the Jeffrey machines a motor of a capacity proportional to the weight has been adopted. This permits the locomotive to operate up to the slipping point of its wheels without overheating or burning any part of the motor. Controllers of the magnetic blowout type and rheostats of the cast grid type are used on all their standard equipments.

Ball bearings in Jeffrey motors for mine locomotives have been standard for several years. The most important advantages of the application of ball bearings to motors in mine service are: the motor has a uniform air gap, consequently more uniform commutation; the armature is never on the pole pieces, therefore the armature bands and armature coils are never injured; excess of lubrication is unknown, thereby eliminating the disintegration of commutator insulation which becomes a general nuisance on the bush bearing motor. The brushes have a small movement in the brush holders, and as a consequence they have a longer life. The commutator runs truer and takes a better polish. The immense amount of saving which is made possible by the application of ball bearings to motor armatures can hardly be overestimated. Locomotives having such equipment are out of commission less often, producing more continuous output and eliminating the cost of repairs due to worn out armature linings.

The mechanical arrangement of the standard details has been worked out to make all parts of Jeffrey locomotives accessible for inspection and repairs.

The frames of the locomotives, up to and including 6 tons in weight, are made of structural steel, with either wood or cast bumpers. From 7 tons up to and including 30 tons weight the frames are made of solid steel slabs for locomotives known as the "armorplate type." As safety is now the first consideration in the development of machinery for the mining industry, so, naturally, the solid steel plate suggested itself for locomotive frames because it is practically indestructible and affords great protection to the motorman and trip rider in case of head-on collisions. In addition to that the locomotive is never permanently out of commission owing to broken side or end frames. The cost of upkeep for this construction is a minimum. The "armorplate" type of frame allows the greatest percent. of weight to be used for motor equipment for a given weight of locomotive.

Gathering locomotives are now commonly used instead of mules for hauling loaded cars from the coal faces to the partings and for returning the empty cars. Jeffrey gathering locomotives are made in three general types: the Electric Cable Reel Locomotive, which enters each room and approaches the working face when gathering and returning cars; the Crab Locomotive, which does not enter the rooms, but which from a position on the entry near the room mouth pulls the loaded cars out of the room by a flexible wire rope which it operates; the Combination Gathering Locomotive, which combines the features of both the Crab and Cable Reel type and is used when it is desirable for the locomotive to enter only some of the rooms.

The storage battery locomotive has proved practical, economical and reliable for gathering purposes in mines where the average grades are not too severe and the haul not extremely long. Its operation is simple and is not restricted by the length of the cable. Only one man is necessary to handle both the locomotive and the cars. It is economical in upkeep because it does away with the necessity for trolley wire, feeder, bonding and flexible cables. One of these locomotives will replace 3 or 4 mules and save the cost of drivers, feed, harness, shoeing and hospital expense. It will go anywhere that track is laid.

This breast type coal cutter is used extensively for driving entries and cutting narrow faces, and is especially adapted for seams 2 1/2 to 4 feet thick

In Jeffrey coal cutting machinery there are many types. They represent the highest efficiency thus far attained in this apparatus. The Longwall coal cutters are suitable for the most severe conditions. The machine does not cramp if the coal squeezes down; the drive is noiseless, enabling the operator to hear any cracking in the roof and get out of danger; the machine is compact and can be used in any mine that is suitable for such work; the cutter arm is turned by power from the motor, and the feed rope is so guided that the machine is automatically held up to the face.

The Air Power coal cutter is for use in mines where compressed air is most available, and is specially adapted for mines where the cutting is hard. It makes less fine coal and less dust than any machine on the market.

The Breast type of coal cutter is used extensively for driving entries and cutting narrow faces, and for seams ranging from 2½ to 4 feet thick, and where the cutting is extremely hard. These cutters will undercut from 8 to 10 places from 15 to 20 feet wide per shift.

Illustrations showing one of the Jeffrey mine locomotives and these three types of cutters will be found on page 70.

The latest catalogues of their complete lines of elevating, conveying, screening, crushing, power transmission machinery and coal mine equipments may be obtained by addressing the Jeffrey Mfg. Co., 952 N. Fourth Street, Columbus, Ohio, U. S. A.

This company have just announced the removal of their New York branch from 77 Warren Street to 50 Dey Street. At the new address is carried the largest combined stock of its kind in New York City, consisting of power transmission machinery, including shafting, hangers, pulleys, collars, couplings, clutches, bearings, etc.; and of elevating and conveying appliances, including chains, chain attachments, sprocket wheels, malleable and steel elevator buckets, elevator boots, screw conveyors, etc. A large engineering and sales force is also maintained there, with ample facilities for the prompt handling of inquiries and orders pertaining to power transmission, elevating, conveying, pulverizing and coal crushing machinery, as well as electric mine, industrial and storage battery locomotives, mine ventilating fans and coal mining machinery. This branch office is in charge of Mr. George H. Mueller, assistant sales manager of the Jeffrey Company.

Descriptive Booklets issued by the Southern Pacific

THE great railroads of America excel in the beauty and wealth of information of their descriptive booklets. Those issued by the Southern Pacific Company are particularly noteworthy. They contain detailed and handsomely illustrated descriptions of many of the places and regions along this company's lines that are of unusual interest to the tourist and settler. A list of these publications follows:

"Map of California, with Brief Description of Its Resources, Attractions, Topography and Climate," "How to See San Francisco by Trolley and Cable," "San Francisco Hotel Bureau," "Palo Alto," "The Golden Gate Limited," "High Points on Four Great Highways," 'Del Monte Guide Book," "Suggestions for Side Trips from San Francisco," "Central California—Scenic Features—Bulletin No. 6," "The Sunset Limited," "The Southern Pacific," "Big Trees of California," "Trinity County, California," "Tuolumne County, California," "California Beach Resorts," "Wayside Notes along the Sunset Route," "California and Pacific Coast for the Tourist," "Glenn County, California," "Drakesbad," "Beaumont," "California for the Settler," "Monterey County, California," "The Salt River Valley, Arizona," "Truckee-Carson Irrigation Project, Nevada," "The Arizona National Reserve Route," "Jamaica-Panama—Through Cuba Route," "Lake Tahoe," California," "Oregon for the Settler," "The Tahoe Country," "Riverside County, California," "Shasta County, California," "Sonoma County, California," "Sacramento County, California," "California—Yuba-Sutter Counties," "Tucson, Arizona," "Solano County, California," "The Prize Winning County," "The World Traveler de Luxe," "San Mateo County," "Lodi, California," "Contra Costa County," "Sacramento Souvenir Guide," "San Bernardino County, California," "Facts About Sacramento County," "A Desert Cure," "Wayside Notes, West-Bound, Sunset Route," "Coachella Valley, California," "Antelope Valley, Los Angeles County, California," Yolo County, California," "Fresno County, California," "Tulare County, California," "Wayside Notes (South-Bound), Shasta Route," "Map of Nevada" and "Hotel del Monte on Monterey Bay."

Any or all of these booklets can be obtained by writing to or calling on an agent of the Southern Pacific, or by addressing the General Passenger Agent of that railroad at San Francisco, Cal.

F. E. Myers Appointed to the International Jury of Award of the San Francisco Exposition

AN honor that came unsolicited, and which was therefore the more gratifying, was recently conferred on the head of the firm of F. E. Myers & Brother, manufacturers of force and lift pumps, hay tools, etc., at Ashland, Ohio, U. S. A. Mr. F. E. Myers, who is chairman of the Ohio Commission to the Panama-Pacific International Exposition now being held at San Francisco, has been further distinguished by being appointed a member of the International Jury of Award of this great world's fair, and will be specially concerned with the departments of dairy and food products. On this international jury are two members from abroad and three Americans. The work of making the examinations for awards will require some 15 days of steady application.

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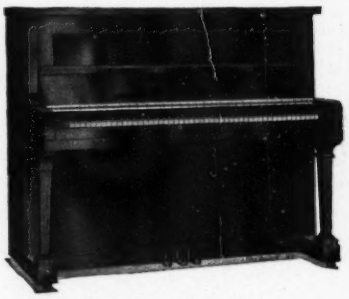

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One Minute Post Card Photographs

"MANDEL-ETTE" is the name of a new camera that has been recently perfected and placed on the market. It is described as "the photographic innovation of the times." Because of its simplicity of operation it enables any person—even a child—to make pictures successfully without any previous photographic experience.

The "Mandel-ette" is practically a complete, portable photo gallery. It is no larger or heavier than the ordinary camera. It measures about 4x4½x6 inches and weighs 24 ounces. This lightweight, compact camera embodies every necessary feature to make finished pictures on 2½x3½-inch post cards, by photographing the subjects directly on the cards, thus eliminating the need for plates, films, dark room, developing trays, and all the other usual expensive camera accessories. It finishes the pictures in one minute's time. No more careful watching of pictures is necessary because the "Wonder" 3-in-1 Developer, which is used for developing the pictures, is a single solution that embodies all the properties of a developing, fixing and toning solution and removes all danger of the overdeveloping of pictures.

The "Mandel" Positive Process post cards used for making pictures with the "Mandel-ette" Camera mark an important improvement in photography because of the fact that the paper, sensitized by a special process, does away with the necessity for films or plates in making the negative.

The "Mandel-ette" Camera is semi-automatic. It consists of a metal magazine card-holder into which fifty post cards are loaded at one time. Therefore, fifty exposures may be made before reloading is necessary. The cards may be put in place in broad daylight, thus eliminating the need for a dark room. When the magazine is loaded and the developing tank filled with liquid developer, the pictures are then snapped in rapid succession, placed into the developing cup, and in less than a minute from the time the subject is photographed, the picture is ready—completely finished. The manufacturers guarantee that the pictures made by this new method of photograph will not fade, and will last just as long as any other photograph.

This postcard camera takes and finishes pictures in one minute's time

Old camera users, professional and amateur photographers, will appreciate this new method of picture-taking, because it eliminates the many annoyances and bothersome work in a hot, dark room. The "Mandel" Positive Process also cuts the cost of making finished pictures, for with the "Mandel-ette" camera, pictures are made at an average cost of 1½c. each, about one-tenth the cost of ordinary photography. The most valuable feature of this new method is that it is not necessary to wait impatiently to see the results, the pictures are seen at once—right on the spot where they are taken and in about one minute.

An excellent opportunity is offered to dealers and agents for the sale of "Mandel-ette" Cameras and the necessary material used in connection with them. For particulars and other information about these cameras and photographic supplies, address: The Chicago Ferrotype Co., Dept. D. R., Ferrotype Building, Chicago, U. S. A.

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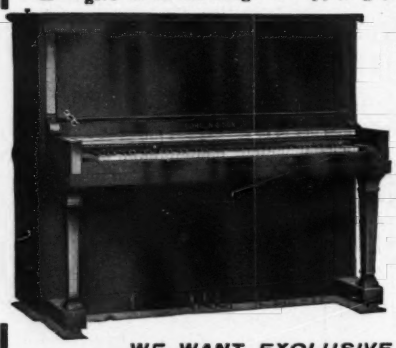

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Style 21 Player Piano measurements are the same with the exception of the depth which is 68.58 centimetres. This is the smallest Player Piano in depth on the market.

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